

The Case for Curation: The Relevance of Digest and Citator Results in Westlaw and Lexis

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Abstract:

Humans and machines are both involved in the creation of legal research resources. For legal information retrieval systems, the human-curated finding aid is being overtaken by the computer algorithm. But human-curated finding aids still exist. One of them is the West Key Number system. The Key Number system's headnote classification of case law, started back in the nineteenth century, was and is the creation of humans. The retrospective headnote classification of the cases in Lexis's case databases, started in 1999, was created primarily - although not exclusively - with computer algorithms. So how do these two very different systems deal with a similar headnote from the same case, when they link the headnote to the digest and citator functions in their respective databases? This paper continues the author's investigation into this question, looking at the relevance of results from digest and citator searches run on matching

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headnotes in Westlaw and Lexis for ninety important federal and state cases, to see how each system performs. For digests, where the results are curated where a human has made a judgment about the meaning of a case and placed it in a classification system humans still have an advantage. For citators, where algorithm is battling algorithm to find relevant results, it is a matter of the better algorithm winning. But neither algorithm is doing a very good job of finding all the relevant results; the overlap between the two citator systems is not that large. The lesson for researchers: know how your legal research system was created, what involvement, if any, humans had in the curation of the system, and what a researcher can and cannot expect from the system being used.

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Introduction

It is late at night in a law office, and a new lawyer is staring at a computer screen. The firm's client is a local community college defending its affirmative action program. The lawyer has been asked to find all of the cases regarding the law on this issue: where have courts upheld affirmative action programs as being properly tailored to serve a compelling state interest, and where have the programs been struck down? The lawyer has been told that the key Supreme Court case in this area is *Regents v. Bakke*. While not every research project involves finding every case that might be relevant on a specific topic, some do. This one does. The firm is working *pro bono* on the case and the ideological stakes are high. There are eleven million cases out there.² What systems are in place to help find the needles in the haystack? And how do

² Email from Jeff Brandimart, Academic Account Manager, Thomson/Reuters, June 15, 2012. Copy on file with the author; Email from Michael Morton, Regional Academic Manager, Rocky Mountain-Plains Region, LexisNexis, sent June 8, 2012; copy on file with the author.

those systems compare? Two major systems for finding cases are digests and citators.³ These are time-honored methods for moving from one good case to finding related and more factually similar cases.

Because Lexis and Westlaw created their systems very differently, this article will also explore whether or not the different ways the systems work make a difference in the results found. Starting in 1999, Lexis retrospectively created headnotes for all of the cases in its case databases, and placed each headnote in a newly designed classification of the law. The system was built with considerable assistance from algorithms. Westlaw's headnotes for cases and its classification of the law evolved from a human-generated classification system dating from the 1890s. Both the Lexis and Westlaw systems are designed to support digest functions - finding other cases on your topic - and citator functions - finding other cases that cite your case on your topic - from a headnote in a case.⁴

The paper continues the investigation of the relevance of results from the digest and citator functions in both Lexis and Westlaw that started with ten pairs of matching headnotes

³ In this paper, LexisNexis's lexis.com will be referred to as Lexis, and Thomson/Reuters's westlaw.com will be referred to as Westlaw.

⁴ This paper makes the following assumptions about the Lexis and Westlaw systems: each provider has a similar number of cases in its databases; the published cases are the same for each database provider; each database provider system has some of the same unpublished cases and some unique unpublished cases; each put sufficient effort and resources into creating and maintaining their headnote and classification systems; each has similar incentives to make sure that their digest and citator systems function properly; the citators for both systems are designed to return cases that cite your case on the headnote topic and the digest functions are designed to return cases on your headnote topic, whether or not your original case is cited; and finally, the algorithms that assist in the creation of headnotes, in linking headnotes to citing references in citators, or in linking headnotes to cases on similar topics, are trade secrets, and cannot be compared.

from legally important federal and California cases.⁵ After reviewing the cases in the result sets generated by the digest function in each system for relevance, that study's preliminary finding about relevance was that there was an advantage to the value added by human-indexing in the Westlaw Key Number system. This made a preliminary case for curation where curation is the intervention of a human in organizing data.⁶ Human indexing appeared to add value to the search process by improving the percentage of relevant results. When limiting citator results by headnote, the comparison is algorithm versus algorithm. The previous study found that neither system had an important relevance advantage nor was there a strong overlap in the results generated by each system. Because the ten cases used in the previous study was not a statistically significant data set, this second study increased the size of the cases compared by an additional ninety important federal and state cases with matching headnotes. Law students reviewed the result sets generated by each digest and citator system, using a stated standard of relevance for each case. In the case used as an exemplar in this paper, the standard of relevance is: *a case is*

⁵ Susan Nevelow Mart, *The Relevance of Results Generated by Human Indexing and Computer Algorithms: A Study of West's Headnotes and Key Numbers and LexisNexis's Headnotes and Topics*, 102 LAW LIBR. J. 221 (2010).

⁶ See, e.g., Tom Foremski, *Curation and the Human Web*, ZDNet, <http://www.zdnet.com/blog/foremski/curation-and-the-human-web/1581?edition=asia>. Discussing curation on the web, Foremski says: Curation is important because we are reaching the limits of what can be achieved through algorithms and machines in organizing and navigating the Internet. Aggregation looks like curation but it's not. I define curation as a person, or a group of people, engaged in choosing and presenting a collection of things related to a specific topic and context. Aggregation employs software (algorithms) and machines (servers) to assemble a collection of things related to a specific topic and context. Aggregation tools can be employed by curators but the human act of curation adds a layer of value that aggregation alone cannot provide. *Id.* See also, Pete Cashmore, *Humans vs. Automated Search: Why People Power is Cool Again*, CNN, http://articles.cnn.com/2011-01-13/tech/people.power.cashmore_1_google-popular-search-terms-search-results?s=PM:TECH. ("Are we seeing the first signs that algorithmic search has failed as a strategy? Is the next generation of search destined to be less algorithmic and more social?" The answer appears to be yes).

relevant if it discusses the types of affirmative action program that are or are not tailored to serve a compelling state interest.

The paper first reviews the research process. The creation of the Westlaw and Lexis systems are briefly described. Then previous full-text database tests are reviewed, and the benefits and detriments of both human indexing and algorithmic indexing are discussed. The protocols for choosing and searching cases are described. Then the two very different systems were tested. The results from the first test were confirmed. For digests, Key Number results had a higher percentage of relevant results than either digest function available on Lexis, indicating that there is some benefit of human indexing in search results. For citators, where both systems rely on algorithms to match headnotes, Lexis's Shepard's algorithm produced slightly more relevant results than Westlaw's KeyCite algorithm, but the overlap in cases between the two systems is still very small. The differences in the results sets for digest and citator systems illustrate the fact that no one system or type of resource returns comprehensive results. These limitations have implications for both the research process and for teaching the research process.

Human Indexing and Computer Algorithms

Legal research has always been characterized by complex legal tools, and the path from using Shepard's and the *Federal Digest* in print to today's hybrid and bewildering array of online and print resources has not brought any relief from that complexity. It is harder and not easier to teach law students how to understand the research tools available to find controlling primary law.⁷ It was and still is true that each finding aid offers different - but not complete - methods of finding relevant authority, but the redundancy of results found in the array of resources a researcher

⁷ See, e.g., Robert C. Berring, *Legal Information and the Search for Cognitive Authority*, 88 CAL. L. REV. 1673 (2000).

consults is supposed to help fill in any gaps.⁸ When all the available resources are “used together they offer the researcher a good chance of finding all relevant legal authority on any issue.”⁹

The legal research environment is characterized not only by print and online resources, but by two differing search modes for those resources, characterized by the human versus machine component each contains. Indexes, tables of contents, and subject heading systems frequently start out human-generated, although computer algorithms may assist. These are finding aids for large data sets such as cases, statutes, regulations, or law reviews.¹⁰ Then there are the search modes that utilize computer-generated search results, such as natural language search strategies in full-text databases. Within the full-text environment, the human and machine continuum can be expressed by looking at Boolean searching versus natural language searching or other advanced algorithmic searching. No researcher understands what is happening with natural language searching; the results are being delivered by complex and trademarked algorithms that operate in obscurity. Natural language indexing of documents in databases has a further hidden complication:

attempts to augment the authentic text of legal sources with semantic metadata introduces an interpretation of the legal sources, which get hidden in the system unbeknownst to the user, even if users’ interpretations may differ from the systems.¹¹

⁸ William R. Mills, *The Shape of the Universe: The Impact of Unpublished Opinions On the Process of Legal Research*, 46 N. Y. L. SCH. L. REV. 429, 442 (2002).

⁹ *Id.* One beauty of legal research is the redundancy that is built into the system. Mary Whisner, *Practicing Reference...Researching In An Imperfect World*, 91 LAW LIBR. J. 637, 638 - 639 (1999).

¹⁰ This list is illustrative, not exhaustive. There are finding aids for many more data sets than can be conveniently listed.

¹¹ Staffan Malmgren, TOWARDS A THEORY OF JURISPRUDENTIAL RELEVANCE RANKING: USING LINK ANALYSIS ON EU CASE LAW, Master of Laws Thesis, Stockholm University, Sept. 4, 2011, at 13.

Boolean searches, on the other hand, are controlled by humans. Although a machine is carrying out the commands, it is the human who is specifying exactly how the search should be executed. Along the human/machine continuum in today's search environment, being able to understand and control the algorithm puts Boolean searching on the human side. And human-assisted aids exist in both print and online search environments. Human-assisted finding aids such as catalogs, indexes, Westlaw's Key Numbers, and (where prepared by humans) tables of contents can be found online. Full-text searching of "books" such as treatises and practice guides is available online, and the online versions increase in usability each year.¹²

One way to address the complexities of the current legal research environment is to focus on the benefits and detriments of different search modes. What value is added by human indexing? What are the drawbacks? What value is added by allowing complex natural language searches to do the work? What are the drawbacks? What value is added by creating a Boolean search? What are the drawbacks? What is the quantum of human intervention in a particular resource? How is the researcher interacting with a particular resource, and what impact is the design of the resource having on the search process?¹³ The answers to these questions can be taught to law students using both online databases and print resources; the knowledge translates to the evaluation of any new legal resources that emerge, or to the resources that lawyers actually encounter in a work environment, once they leave school. This is important because the legal

¹² Of course, one of the reason treatises and practice guides online are now easier to use than they used to be is the addition of those human-assisted finding aids to the online environment.

¹³ Although beyond the scope of this article, the cyborg nature of legal research should be noted. Not only is there a human/machine continuum in the tools we use, there is a continuum in our use of the tools and the impact the tools have on us as researchers. See, e.g., Donna Haraway, *A Cyborg Manifesto: Science, Technology and Socialist-Feminism in the Late 20th Century*, in *SIMIANS, CYBORGS & WOMEN: THE REINVENTION OF NATURE* (1991) at 146: "The machine is not an *it* to be animated, worshipped, dominated. The machine is us, our processes, as aspect of our embodiment. We can be responsible for machines; *they* do not dominate or threaten us. We are responsible for boundaries; we are they."

resource environment will not remain static.

Mental Models and the Contours of the Law

Before a lawyer starts research in a new area of the law, some context is needed. Getting that context involves understanding the general contours of a specific area of law and developing “an appropriate base-level mental model of the law under consideration.”¹⁴ When asked, attorneys, law firm librarians and legal research teachers all recommend starting research with a secondary source – a treatise or practice guide, law review article or ALR annotation - to get context for a new research problem.¹⁵ Using one of these secondary sources will give a researcher a framework for the legal problem, and citations to the major cases, statutes and regulations. Our hypothetical new lawyer has been given the name of a good case, so for level one research – to get context - that case can be used to find relevant entries in a treatise. A researcher might review EDUCATION LAW: FIRST AMENDMENT, DUE PROCESS AND DISCRIMINATION¹⁶ or GOVERNMENT DISCRIMINATION: EQUAL PROTECTION LAW AND LITIGATION¹⁷ on Westlaw, or

¹⁴ Stuart A. Sutton, MANAGING LEGAL INFORMATION: A MODEL OF INSTITUTIONAL MEMORY BASED ON USER COGNITIVE MAPS, Ph.D. Thesis, University of California at Berkeley, 1991, at 10. Mr. Sutton also calls this “level-one research.” *Id.* Getting an understanding of the contours of the law means reading enough cases in as specific area to know the core cases both supporting and weakening the legal concept a researcher is researching. *Id.*

¹⁵ Patrick Meyer. *Research Requirements for New Attorneys: Survey Results and Findings: New Attorneys' Research Skills. What They Have vs. What They Need.* University of Southern California Gould School of Law. May. 2010, available at: http://works.bepress.com/patrick_meyer/2; *White Paper: Research Skills for Lawyers and Law Students*, Thomson/West 2011. See also, Judith Lihosit, *Research in the Wild: CALR and the Role of Informal Apprenticeship in Attorney Training.* 101 L. LIBR. J. 157, 170: “All the attorneys I interviewed stated that if they were researching an unfamiliar area of law, they would start by consulting with an appropriate secondary source, such as a practice guide, a legal treatise, or an encyclopedia, or a document repository, in order to become familiar with what one termed the ‘legal landscape.’”

¹⁶ Ronna Greff Schneider, EDUCATION LAW: FIRST AMENDMENT, DUE PROCESS AND DISCRIMINATION (2011).

¹⁷ James A. Kushner, GOVERNMENT DISCRIMINATION: EQUAL PROTECTION LAW AND LITIGATION (2011).

EDUCATION LAW¹⁸ on Lexis. These books are also available in print. But getting a little context and a few good citations to primary law will not typically end the research process. It is rare that the facts of a particular client's case fit that closely to the cases found in the secondary sources. The researcher needs to find other cases, similar in legal conclusions and more similar factually to the client's case. This search for more specifically relevant primary law can be called "level two research."¹⁹ Having located a few good cases, the cases can be used as seed documents to link forward in time using the citator functions, or forward and backward in time using the digest functions in Lexis and Westlaw.²⁰ This type of forward and backwards searching from seed documents is instrumental for finding "application cases," cases "that have only marginal value as support for an abstract proposition of law, [but] have great value in their application of the proposition to facts similar to or analogous to the facts of your own case."²¹

Finding relevant cases can be a daunting task, even with good seed cases. There are so many cases. Westlaw and Lexis both have approximately eleven million cases.²² Trying to find relevant case law in the ever-increasing mass of cases has been the cause of both bitter complaint and legal publishing opportunities.²³ Both digests and citators were created to tame the explosion

¹⁸ James A. Rapp, EDUCATION LAW (2012).

¹⁹ MANAGING LEGAL INFORMATION, *supra*, note 4, at 11-12: this is the part of research process where the researcher hopes to find cases whose facts are "sufficiently similar to those of the client that a reasonable argument can be made that the court *should* rule similarly."

²⁰ This "forward chaining" and "backward chaining" is a component of a search strategy called "berry-picking" in the information science literature. Andrew Booth, *Using Evidence in Practice: Unpacking Your Literature Search Toolbox: On Search Styles and Tactics*, 25 HEALTH INFORMATION & LIBR. J. 313, 316 (2008). Citation and digest systems were developed very early for case law, so this method is very highly developed. See footnote 70, *infra*.

²¹ Douglas K. Norman, *The Art of Selecting Cases to Cite*, 63 TEX. B. J. 34, 3410 (2000).

²² *Supra*, note 2.

²³ In the mid-nineteenth century, citators as a concept were a response to the growing body of case law. Pattie Ogden, *Mastering The Lawless Science Of Our Law: A Story Of Legal Citation Indexes*, 86 LAW LIBR. J. 1 (1993). And the earliest online legal databases, dating from the 1950s and 1960s, were similarly attempts to address the problems caused by the growing number of

of case law,²⁴ and the use of headnotes allowed extremely granular case linking, forward and backward, from any headnote topic in one case to every other case on that topic.²⁵ Because Westlaw started its human indexing so long ago, it does not suffer from the nearly insurmountable problem of newcomers to the field: it is an enormous expense to manually index a large document collection.²⁶

Finding all of the relevant cases on a point of law is not the goal of every research assignment. All cases are not equally important or even equally complex. A lawyer may need only a quick answer to a limited question, and simple problems will not require exhaustive research. But, it does happen that because of the novelty of an issue, the importance of an issue, or the importance of a case to a client, exhaustive research *is* required. Mining headnotes with digests and citators is one effective way to find all of the cases in a particular area of the law.

Currently, both Westlaw and Lexis offer digest and citation-checking systems as methods of retrieving targeted application cases, although the systems were originally created in very different ways. Those different methods of creation mean that comparing the relevance of results generated by each system will offer interesting insights into the benefits and detriments of both primarily human-generated and primarily algorithmically-generated results.

Creating Headnotes and Linking Them to the Digest and Citator Systems

As a guide to the discussion of the Lexis and Westlaw systems, here is a brief taxonomy of functions and concepts:

cases. Jon Bing and Trygve Harvold, *LEGAL DECISIONS AND INFORMATION SYSTEMS* 60-66 (1977).

²⁴ Ross E. Davies, *How West Law Was Made: The Company, its Products, and its Promotions*, *CHARLESTON LAW REVIEW* 6 (Winter 2012): 231-282, at 234; Pattie Ogden, *supra*, note 21.

²⁵ ; cite to *Fundamentals of Legal research re headnotes*

²⁶ Malmgren, *JURISPRUDENTIAL RELEVANCE RANKING* , *supra*, note 11 at 12.

A **headnote** is “a case summary that appears before the printed judicial opinion in a law report, addresses a point of law, and usually includes the relevant facts bearing on that point of law.”²⁷

Shepard’s is Lexis’s online citator system.

KeyCite is Westlaw’s online citator system.

Key Numbers are the components of Westlaw’s classification system of the law.²⁸

Lexis’s Topics are the components of Lexis’s classification system of the law.²⁹

More Like This Headnote is Lexis’s alternative digesting function, based on the headnote language³⁰

Westlaw Headnote Creation and its Key Number Classification System

In Westlaw, headnotes are created by having a human editor take the legal concepts from a case and summarize them in the editor’s own language.³¹ The headnote is then placed, by a human, into the appropriate Key Number in the Westlaw Digest classification system.³² The Westlaw Digests are “basically compiled subject arrangements” of the Westlaw’s headnotes,³³ so there is a direct correlation between the headnote and the related Key Number. The Westlaw Digest system was created in the late nineteenth century and the system has been evolving since then, adding new topics when necessary.³⁴ There are currently over 400 topics, and over 100,000

²⁷ Black’s Law Dictionary, 9th ed. (2009).

²⁸ WEST’S ANALYSIS OF AMERICAN LAW (2011), v.

²⁹ On lexis.com, clicking on “Search by Topic or Headnote” links to a page with Lexis’s classification system, and this note: “Use this page to find legal data based on **areas of law and related legal topics.**” lexis.com, visited June 24, 2012.(bold in original)

³⁰ LexisNexis® Headnotes Tutorial - Textual Version, <http://web.lexis.com/help/multimedia/hn2.textOnly.htm>, accessed June 24, 2012.

³¹ The “editor’s own language” does sometimes parallel the exact language of the court, but Westlaw editors are free to, and do, summarize legal concepts in their own words. HOW TO FIND THE LAW, 9th ed., Morris L. Cohen, Robert C. Berring, and Kent C. Olson, West Publishing Co.: St. Paul, MN (1989) at 84.

³² *Id.* at 84. Although the creation of headnotes is human-generated at this point in time, the process of matching the headnote of a target case with the language of citing cases is performed by computer algorithms. *Id.* at 86, 90, 97 (KeyCite depends on “automation” or “computer programs” for headnote assignment).

³³ *Id.*

³⁴ *Id.* at 84.

individual Key Numbers in the classification system.³⁵ In 2006, Westlaw’s classifiers were manually classifying headnotes in 350,000 new cases, and placing them in the Key Number classification system”.³⁶ The part of the Westlaw outline that generally discusses affirmative action in education, for example, looks like this online:³⁷

Westlaw Outline of the Law



³⁵ WEST’S ANALYSIS OF AMERICAN LAW, *supra*, note 28 at

³⁶ See, e.g., Document Classification System, Method and Software, U.S. Patent 7,065, 514 (issued June 20, 2006). Email from Westlaw,

³⁷ Screen reprinted from Westlaw with permission; Copyright 2012.

West's Citator System: KeyCite

Westlaw did not have a fully-fledged citator system until 1997.³⁸ The citator system that emerged victorious in the 19th and 20th centuries was Shepard's.³⁹ Shepard's and online enhancements to Shepard's were available online in both Lexis and Westlaw for some years, but when Lexis bought Shepard's in 1996,⁴⁰ Westlaw created its own online citator system, KeyCite.⁴¹ In KeyCite, linking from a specific headnote to other cases citing the original case on that headnote is done using computer algorithms.⁴²

Lexis's Headnote Creation and its Lexis Topics Classification System

In the Lexis system, when headnotes are created, the fundamental legal points of a case are drawn directly from the language of the court.⁴³ Lexis Topics⁴⁴ are the correlate for the West

³⁸ Elizabeth M. McKenzie, *Comparing KeyCite with Shepard's Online*, 17 LEG. REF. SERV. Q. 85 (1999). Westlaw did dabble in citator systems before KeyCite, but none of them took root. See generally, Pattie Ogden, *Mastering The Lawless Science Of Our Law*, *supra*, note 20.

³⁹ *Id.* at 34-36.

⁴⁰ Iver Peterson, *The Media Business: Times Mirror in Two Deals To Bolster Legal Publisher*, NYTimes.com.

<http://www.nytimes.com/1996/07/04/business/the-media-business-times-mirror-in-two-deals-to-bolster-legal-publisher.html>, July 04, 1996

⁴¹ Elizabeth M. McKenzie, *Comparing KeyCite with Shepard's Online*, *supra*, note 28 at

⁴² *Id.* at, 86, 90, 97 (KeyCite depends on "automation" or "computer programs" for headnote assignment).

⁴³ *LexisNexis(R) Headnotes Now Integrated With Shepard's Citations Service; Integration of Headnotes Further Elevates Value of Industry's Premier Citation Tool for Legal Research*, Jun.29, 2005, at -- <http://www.tmcnet.com/usubmit/2005/Jun/1159530.htm>. Lexis released its classification system in 1999, as an alternative to the Key Number System. *The LexisNexis Timeline: Celebrating 30 Years of Innovation*,

http://www.lexisnexis.com/anniversary/30th_timeline_fulltxt.pdf: "LEXIS Search Advisor helps legal researchers create effective searches through the selection of terms from a practice area-based classification system of legal topics and is an alternative to searching the West Key Number System®."

⁴⁴ "Search by Topic or Headnote" is called "Lexis Topics" for ease of reference.

Key Number System; here is what the Lexis outline of the law on affirmative action in education looks like:⁴⁵

Lexis Outline of the Law



Lexis Topics are a retrospectively created classification system, and the evidence suggests that the role of human editors in assigning headnotes to the topical classification system is limited.⁴⁶ Instead, algorithms appear to be doing the majority of the work on headnote assignment. Lexis has a patent “for classifying concepts (such as legal concepts, including points

⁴⁵ Copyright 2012 LexisNexis, a division of Reed Elsevier Inc. All Rights Reserved. LexisNexis and the Knowledge Burst logo are registered trademarks of Reed Elsevier Properties Inc. and are used with the permission of LexisNexis.

⁴⁶ Michael Ginsborg, *Does Search Advisor Depend Too Little on Classifiers, and Too Much on Algorithms, for Headnote Classification? Evidence on the Perils of Search Advisor’s Automation and the Virtue of Thomson-West Classifiers* (Aug. 1, 2007). <http://ssrn.com/abstract=1345465>. All of the available evidence suggests that LexisNexis editors have neither classified headnotes of most new cases, nor retrospectively classified the headnotes of most other cases. Rather, the evidence suggests that headnote classification has been largely automated by algorithm. Part of the evidence for these conclusions depends on how headnote retrieval works on Search Advisor, and on a LexisNexis patent to automate legal-topic classification.

of law from court opinions) according to a topic scheme (such as a hierarchical legal topic classification scheme.)”⁴⁷ The process seems to function by having a human editor classify sample headnotes that become part of a designated knowledge base, and then algorithms take over, extracting features from sample headnotes, and ranking each feature for relevance to the assigned topic(s).⁴⁸ Classifying headnotes this way involves algorithmic assignment of topics to initially unclassified, or “candidate,” headnotes, based on similarity between the candidate features and topically-ranked features of the sample headnotes. Then the features of newly classified headnotes receive topical-relevance scores, and these features are added to the knowledge base, providing further means, or feedback, for comparison between classified headnotes and candidate headnotes.⁴⁹ Indeed, the application for one of Lexis’s patents acknowledges that it needs automated document review and algorithmic rule extraction to get the job done,⁵⁰ and that the manual process used by Westlaw is not possible to replicate.⁵¹

⁴⁷ *Id.* Mr. Ginsborg identifies the LexisNexis patents as follows: “System and Method for Classifying Legal Concepts Using Legal Topic Scheme,” U.S. Patent 6,502,081 (issued Dec. 31, 2002); “Computer-based System for Classifying Documents Into a Hierarchy and Linking the Classifications to the Hierarchy”, U.S. Patent 5,794,236 (issued Aug. 11, 1998) (describing algorithmic classification of cases by means of matching case citations with topically-linked citations); and “Landmark Case Identification System and Method,” U.S. Patent Application 20060041608 (issued Feb. 23, 2006) (Search Advisor samples used to illustrate a system of cases arranged by topic in digest format, with a user option to rank cases by frequency of citation). *Id.* LexisNexis has not acknowledged or denied that it uses these patents to create Lexis Topics. *Id.*

⁴⁸ *Id.* This process sounds similar to the concept of predictive coding used in document discovery. *See, e.g.*, Ralph Losey, *Predictive Coding Based Legal Methods for Search and review*, e-Discovery Team, <http://e-discoveryteam.com/2012/03/25/predictive-coding-based-legal-methods-for-search-and-review/>, visited July 13, 2012.

⁴⁹ *Id.* This is an extreme simplification of a process described in great detail by Mr. Ginsborg.

⁵⁰ *Id.* Mr. Ginsborg analyzes the sheer numbers of cases retrospectively classified, and the number of Lexis editors, and concludes that the likelihood of getting the job of assigning headnotes to the classification system done without the majority of the work being done by humans is incredibly low. *Id.* Lexis’s application for a patent related to the classification system, Computer-based System and Method for Finding Rules of Law in Text, U.S. Patent 6,684,202 (issued Jan. 27, 2004) [hereinafter ‘202 patent] states: “In the prior art, ascertaining the rule or rules of law in any given decision required an individual to manually read through the text of

Lexis's Citator System: Shepard's

For Lexis's online citator system, Shepard's, "the text of the headnote of the Shepardized case is compared algorithmically with language from the citing cases to identify references (within the citing case) that match the language of the LexisNexis headnote within the Shepard's report." ⁵² Then, the Lexis headnotes are linked to Lexis Topics to try and build a linked classification system. According to Lexis, the topics that are used to classify LexisNexis headnotes are the same topics that appear in Lexis Topics.⁵³

There are therefore two very different systems for classification for digest. Westlaw creates a direct correlation between a headnote (drafted by a human editor) and the related Key Number topic, relying on human editing to assign headnotes to a point in a classification system. LexisNexis relies primarily (although not exclusively) on algorithms to assign a headnote to a

court decisions. This is time consuming and requires the reviewing individual to read a lot of superfluous material in the effort to glean what are often just a few, pithy rules of law. Therefore, a need exists for a way to automate document review while still accurately identifying the rules of law." *Id.*

⁵¹ "[T]he process of classifying legal case-law opinions remains dominated by West Publishing, Co. and remains a manual process. A tremendous amount of human resources is needed to maintain the West Publishing, Co.'s [now Thomson-West's] manual process of classifying legal documents. Additionally, since lawyers desperately need case-law opinions dating back to the beginnings of the law, new competitors are virtually precluded from entering this field because of the level of manual effort required to read historical case-law decisions." Computer-based System for Classifying Documents Into a Hierarchy and Linking the Classifications to the Hierarchy, U.S. Patent 5,794,236 (issued August 11, 1998) [hereinafter '236 patent] (describing algorithmic classification of cases by means of matching case citations with topically-linked citations). Ginsborg, note 28.

⁵² Citing Cindy Spohr, Senior Director, LexisNexis Librarian Relations Group, in an email from Debra Myers, Account Executive, LexisNexis, (Apr. 3, 2006, 11:23:15 PDT) (on file with the author). When this email was sent, "Search by Topic or Headnote" was called Search Advisor. *Search Advisor Evolves*, LEXISNEXIS INFOPRO, <http://law.lexisnexis.com/infopro/Keeping-Current/LexisNexis-Information-Professional-Update-Newsletter//Whats-New/Lexis-Search-Advisor-Evolves-Search-Across-Multiple-Content-Types-Simultaneously/archive10-2007> (Oct. 2007).

⁵³ Cindy Spohr, *supra*, note 21. Despite the use of the same concepts in both headnotes and topics, the linking does not work in practice.

topic in the classification scheme. Despite the attempt to link the content; there is no direct correlation between Lexis's headnotes and the Lexis Topics⁵⁴. For citator systems, both systems use algorithms to link headnotes to matching headnotes in citing references, although the algorithms are different.

If the relevance of the cases that are found when using the Westlaw classification system (Key Numbers) and the relevance of cases that are found using the Lexis classification system (Lexis Topics or More Like This Headnote) are compared, it will be possible to tell whether the difference in the manner of assignment of headnotes to a classification system results in a difference in the relevance and completeness of results. If the relevance of cases found by using the headnote limiter in the two citator system are compared, it will be possible to see if the difference in algorithms matters. The two citator systems are linking from identical cases, on identical legal topics, to all relevant cases in identical jurisdictionally limited databases. So the differences, if any, in results will be the result of the a difference in algorithms. Each of these comparisons has an impact on the process of legal research and how it is taught.

Relevance in Legal Research Results

Most testing of relevance in legal databases has been based on objective standards of relevance -- whether the cases found are or are not on the predetermined list of relevant cases -- but in fact, each user's search needs requires a unique and actually shifting definition of relevance.⁵⁵ For this project, the standard of relevance chosen was subjective, but constrained by the confines of the problem posed by the case being reviewed:

⁵⁴ See pages 58-61, *infra*.

⁵⁵ Stuart A. Sutton, *The Role of Attorney Mental Models of Law in Case Relevance Determinations: An Exploratory Analysis*, 45 J. OF THE AM. SOC. FOR INFORMATION SCI. 186, 196-97 (1994). Looking at the results of a broad search, such as all cases found in the chosen American Law Reports annotation or in the chosen Key Number, may return objectively relevant

The concept of relevance ... is a dynamic notion with roots deep in the way law is practiced in the United States. It is defined here as a function of the mental models or cognitive maps attorneys construct and maintain of the law. Stated simply, a relevant case is one that plays some cognitive role in the structuring of a legal argument or the framing of legal advice. This view of relevance is explicated below through examination of how attorneys use case law in the construction of mental models of controlling principles and how the relevance judgment depends on how the retrieved case “fits” the terrain of the attorney’s evolving model.⁵⁶

Sutton posited that, for example, the exam results of a group of first year law students illustrate mental models of a given area of law that are not entirely congruent, yet the individual models have sufficient agreement to allow the students to communicate rationally with other law-trained actors (other students, professors, lawyers, judges) “about the law and the accuracy of their various cognitive maps.”⁵⁷

Because the concept of relevance used in this study derives from the activity of creating a mental model of an area of law, the research assistants were asked to review the results found by using the digest and citator functions from headnotes in a case by deciding, for each case, if the cited cases in the results set helped fill in a particular mental model of an area of law. This user-oriented focus was intended to put each research assistant in a similar frame of mind about the meaning of relevance.⁵⁸ For example, in *Bakke v. Regents*,⁵⁹ if a case in the result set discussed an affirmative action program that either was or was not sufficiently tailored to serve a compelling state interest, the case was relevant. Relevance was to be considered expansively, so

results, but return many cases that, although perhaps relevant “topically,” will not help an attorney fill in a mental map of an area of law necessitated by a particular client’s situation. *Id.* Relevance is “a complex notion of how a particular document relates to a given line of inquiry.” Scott Burson, *A Reconstruction of Thamus – Comments on the Evaluation of Legal Information Retrieval Systems*, 79 L. LIBR. J. 133, 141 (1987)

⁵⁶ Sutton, *supra*, at 187.

⁵⁷ *Id.* at 188-189.

⁵⁸ Malmgren, JURISPRUDENTIAL RELEVANCE RANKING, *supra*, note 11, at 33. A user orientation affects relevance judgments.

⁵⁹ 438 U.S. 256 (1978)

that the collection of relevant cases found from the three digest and two citator searches would form a mental model of those affirmative action programs whose elements are properly crafted and those that are not properly crafted. In a real-world problem, the elements of the client's actual affirmative plan could be compared along this grid to determine the likelihood of the plan surviving the legal challenge it received.⁶⁰

Determinations of relevance in the real world are subjective, and in the legal world, differing determinations of relevance are a facet of legal analysis. We “can profoundly disagree on the relevance of any particular document.”⁶¹ In addition, the concept of what is relevant changes over time, as the researcher adds to the mental model of an area of law that is being created. But there are some general conclusions that studies have drawn about the cognitive changes that occur during the research process:

It can be observed that the clues that the user makes use of for inferring relevance do not change as the process moves forward, but that different criteria are given different weight over time. As time progresses, the relevance judgment becomes more stringent.⁶²

The framework for this study was designed to guide the concepts of relevance for the cases the research assistants were reviewing. For the ninety cases that were reviewed for this study, each had its own statement of relevance. So for each case, a research assistant had to review each citing reference in light of a particular standard of relevance. For this standard of relevance, “any document which makes a contribution to the evolving model is relevant.”⁶³

Because great seed cases have multiple headnotes and multiple citing references, the research

⁶⁰ Although it was possible to come up with ninety statements or matrices of relevance to test, it was *not* possible to situate each of those matrices in an actual factual setting.

⁶¹ Burson, *A Reconstruction of Thamus*, *supra* note 55 at 136, 141.

⁶² Malmgren, JURISPRUDENTIAL RELEVANCE RANKING, *supra*, note 11, at 30.

⁶³ Sutton, *supra*, note 55 at 194.

assistants limited their search by jurisdiction as well as by headnote. To make sure that the relevance judgments of each research assistant were better than a random choice, a post-study statistical review of the researchers' judgments was created.⁶⁴ If the researchers really were creating a mental model of an area of law in their search for relevant cases, then there should be at least the same sort of congruence that one finds in the mental models first year law students have at the end of an exam.⁶⁵

The Complexities of Retrieval (Recall & Precision)

Every method of retrieving relevant legal information has both positive and negative aspects. The earliest retrieval methods were, of course, human-based. The finding aids for legal materials have a long and rich history. There have been digest-like compilations of legal cases available since 1888.⁶⁶ Discussing the most popular of the systems,⁶⁷ the West Digest system, and incredible complexity of the system, Stephen M. Marx identified four major drawbacks:

- (1) these systems are static in their terminology and not adaptable to vocabulary changes;
- (2) these systems require that the user's thinking conform to the classifications formulated by the systems designers;
- (3) these systems classify the law according to a rigid key word terminology without indicating the context in which the words appear; and
- (4) each of these systems is based on classifying and indexing that has been done by human indexers.⁶⁸

⁶⁴ See also, Jeffrey Luftig, *Statistical Analysis of the Data, Susan Nevelow Mart Study of Search Functions in Lexis and Westlaw* (hereinafter Appendix A), at <http://digitool.library.colostate.edu/webclient/DeliveryManager?pid=174737>.

⁶⁵ Sutton, *supra*, note 55, at 188-189.

⁶⁶ Stephen M. Marx, *Citation Networks in the Law*, 10 JURIMETRICS J.121, 125 (1970).

⁶⁷ The Key Number System was introduced in 1890. West Group: Company History, <http://www.fundinguniverse.com/company-histories/West-Group-company-History.html> (last visited Dec. 9, 2012).

⁶⁸ Marx, *Citations Networks in the Law*, *supra*, note 66. Mr. Marx thought computer-generated systems based on key words alone would suffer from similar defects and proposed a context-based and citation-based retrieval system he characterized as a form of "exhaustive Shepardization" with an assist from "automatically isolating the factual content of a case" *Id.* at

Human indexers may not always anticipate every question a researcher might want to answer with a document, so there is a limit to the concepts in a case that can be classified, and “like any human enterprise, it is not always done as well as it might be.”⁶⁹

Using Westlaw’s Digest system is only one of many resources for conducting legal research. Its classification system has its genesis in the classifications created by both Blackstone and Langdell in the 19th century.⁷⁰ So one other drawback of West’s Digest system is that it works better for concepts that are well-developed in the law and it performs rather less well for newly emerging areas of the law.⁷¹ The benefits of a human indexing system are also well-documented. When a human does the work of reading and analyzing a huge body of law, and places it into an index, the researcher can take advantage of the work already performed. If one understands the index, it is simple to find relevant cases:

125, 137. The article was written, of course, before Shepard’s went online or KeyCite was launched.

⁶⁹ Daniel P. Dabney, *The Curse of Thamuz: An Analysis of Full-Text Legal Document Retrieval*, 78 LAW LIBR. J. 5, 13-14. (1986).

⁷⁰ For a discussion of the West classification system and its impact or lack of impact on the thinking of American lawyers, see Robert C. Berring, *Legal Research and The World of Thinkable Thoughts*, J. APP. PRAC. & PROCESS 305 (2000); Daniel Dabney, *The Universe of Thinkable Thoughts: Literary Warrant and West’s Key Number System*, 99LAW LIBR. J 229, 240-242 (2006); and Joseph A. Custer, *The Universe of Thinkable Thoughts Versus the Facts of Empirical Research*, 102 LAW LIBR. J 251, 251-255 (2010). Since the law is taught, particularly in the first year, as a series of legal concepts that allow for fairly uniform outlining into classification systems, this distillation of the law class into an outline will remain a powerful mental model for most of a lawyer’s work life. For a view on how lawyers actually use digests and Key Numbers, see Lihosit, *Research in the Wild*, *supra*, note 6 at 171, discussing the use of embedded links from headnotes without thinking much of the classification system itself as the method most lawyers use today.

⁷¹ *Id.*, Dabney, *The Universe of Thinkable Thoughts*, at 242: “a pre-coordinated system is necessarily backward-looking, and cannot classify concepts that do not exist in case law.” And see *Id.*, Custer, *The Universe of Thinkable Thoughts*, at 255-256. However, concepts can exist in case law and have to await incorporation into a classification system. Until that happens, the concepts may be hard to retrieve. Try searching the Key Number system for (“personal information” and internet).

The benefits of pre-indexing the law are readily apparent. Rather than the legal researcher having to read and assimilate the information in each book of primary law, the researcher can become familiar with an indexing system and find law relevant to the research topic quickly and easily.⁷²

The perils of relying on computer-generated searches in very large databases are equally well-documented. One major issue is the complexity caused by the huge vocabulary of words available to be searched; the English language and legal language in particular, is rich in synonyms for ideas and concepts.⁷³ A related problem is the literalness of Boolean searching; if every synonym for a word is not added to a search, relevant cases may be missed. The alternative, natural language searching, has its own problems. The sheer number of results can be overwhelming:

Instead of missing relevant documents we get too many non-relevant documents. We experience information overload when it gets impractical to examine large amounts of documents in order to find the few ones with actual relevance.⁷⁴

Research projects vary, and for comprehensive research, a researcher may want every relevant document possible, while for a time-driven request, the researcher may want the system to return the documents that are most highly relevant first.⁷⁵ There are two main standards for evaluating the relevance of the results returned by a search: precision measures the number of

⁷² Ian Gallacher, *Forty-Two: The Hitchhiker's Guide to Teaching Legal Research to the Google Generation*, 39 AKRON L. REV. 151, 179 (2006).

⁷³ See, e.g., Carol M. Bast & Ransford C. Pyle, *Legal Research in the Computer Age: A Paradigm Shift?*, 93 LAW LIBR. J. 285, 293-94 (2001). See also Anton Geist, *Using Citation Analysis Techniques for Computer-Assisted Legal Research in Continental Jurisdictions*, <http://ssrn.com/abstract=1397674> (2009) at 19.

⁷⁴ Malmgren, JURISPRUDENTIAL RELEVANCE RANKING, *supra*, note 11, at 12.

⁷⁵ See, e.g., Burson, *A Reconstruction of Thamus*, *supra*, note 55 at 136-139; Geist, *Using Citation Analysis Techniques for Computer-Assisted Legal Research in Continental Jurisdictions*, *supra*, note 72.???

results returned that are relevant, while recall measures the number of relevant documents in a database that have been retrieved by the search.⁷⁶ Novice researchers believe they have achieved high precision with every search.⁷⁷ Finding *all* of the relevant documents is not necessarily the focus of every research project, but many research projects where the stakes are high do require exhaustive research. The realistic researcher does not believe that all of the relevant documents can be returned by one research resource:

Recall may be overrated in a single research tool...If no alternate means of retrieval exist, high recall becomes more crucial than it otherwise might be... Relevant cases not retrieved using the full-text search capability of LEXIS or WESTLAW may still be found through citators, annotations, digests, law review articles, or other research tools.

In fact, it is quite customary for a legal researcher to expect to consult a variety of tools in the search for information: what should seem strange is the expectation that a single tool might serve as a dispositive source for resolving research issues.⁷⁸

Nevertheless, all researchers would like to get the best results from every search, so knowing whether a database has high precision and high recall is valuable information. Very few studies have been able to determine recall (the number of relevant documents retrieved compared to the number of relevant documents in the database), as the total number of relevant documents in huge databases is usually impossible to determine. In the few studies of size-limited databases,

⁷⁶ Paul Callister's definitions of recall and precision are simple and understandable: "Essentially, there are two conflicting standards for measuring the success of your research. Precision measures how many documents were on point within your search results. In contrast, recall gauges the relevant documents in your results compared to what you could have found." Paul D. Callister, *Working the Problem*, ILL. B. J., Jan., 2003.

⁷⁷ One problem for modern searchers seems to be a belief that - regardless of where the researcher is searching - searches return more than is actually delivered. Novice searchers believe they have actually seen all the relevant documents and that the documents seen are the most relevant documents. Any legal research teacher can confirm this phenomenon.

⁷⁸ Burson, *A Reconstruction of Thamus*, *supra*, note 55 at 136-137.

where the number of potentially relevant documents was known, such as Mr. Dabney's study and the STAIRS⁷⁹ study, recall has been very poor: in both studies, recall was about 20%.⁸⁰

When Mr. Dabney published his study, the objections that were made at the time by representatives of both LexisNexis and Westlaw were that discussing recall and precision in the abstract failed to take into account the many value-added features of both database providers.⁸¹ These kinds of studies are further complicated by the fact that defining what is *relevant* affects the results of the study: early studies used a "rigorous laboratory approach, i.e. , cases were judged relevant only if they meet those on a pre-defined list."⁸² A 2006 study by Dean Mason used a subjective standard for relevance, based on actual attorney inquiries.⁸³

Precision is the number of documents in a search that are judged relevant. Precision is much easier to measure than recall, once the standard of relevance has been chosen. In the large-scale studies that have been performed in legal databases, precision has varied. The results of the

⁷⁹ Dabney's study is reported in *The Curse of Thamus*, *supra*, note 69 at 15, 29. The STAIRS study was a study conducted in a known-item database in the mid-1980s. David C. Blair and M. E. Maron, *An Evaluation of the Retrieval Effectiveness for a Full-Text Document Retrieval System*, 28(3) Proceedings of the ACM, 289 (1985). The study has been vindicated by later research. Eero Sormunen, *Extensions to the STAIRS Study - Empirical Evidence for the Hypothesised Ineffectiveness of Boolean Queries in Large Full-Text Databases*, 4 INFORMATION RETRIEVAL 257(2001).

⁸⁰ Dabney, *Curse of Thamus*, *supra*, note 69 at 15, 29.

⁸¹ J. McDermott, *Another Analysis of Full-text Legal Document Retrieval*, 78 L. LIBR. J. 337 (1986); C.E. Runde & W.H. Lindberg, *The Curse of Thamus: A Response*, 78 L. LIBR. J. 345 (1986);

⁸² K. Gerson, *Evaluating Legal Information Retrieval Systems: How Do the Ranked-retrieval Systems in WESTLAW and LEXIS Measure Up?*, 17 LEGAL. REF. SERVICES QUARTERLY 53 (1999)

⁸³ Dean Mason, *Legal Information Retrieval Study – Lexis Professional and Westlaw UK*, 6 LEGAL INFORMATION MANAGEMENT 246, 247, 284 (2006), available at <http://journals.cambridge.org/action/displayFulltext?type=1&fid=561544&jid=LIM&volumeId=6&issueId=04&aid=561540>. Mr. Mason used actual research requests from lawyers as queries for his test, and tested the first ten results of fifty separate searches *See also*, *The Role of Attorney Mental Models*, *supra*, note 26, at 187, discussing the concept of relevance in actual case law retrieval: "a relevant case is one that plays some cognitive role in the structuring of a legal argument or the framing of legal advice."

major tests were summarized in Mason’s study.⁸⁴ (See Table 1). Precision has varied; the STAIRS study in a preconfigured database of cases had 79% precision, and that is pretty high.⁸⁵ The later studies by Dabney and Gerson compared Westlaw and Lexis, while the Mason study used the UK versions of Lexis and Westlaw.

Comparison of Precision Studies

Study	Precision	
Dabney	12.4% Westlaw	11.5% LexisNexis
Gerson	37% Westlaw	31% LexisNexis
Mason	81% Westlaw	74% LexisNexis

Of course, the higher the precision of your search – the more documents in your result set that were relevant -- the poorer the recall – the more relevant documents there were in the entire database that your search failed to retrieve. The inverse relationship between precision and recall is “the universal principle of information science.”⁸⁶ And when searching in a database with millions of documents, researchers will necessarily miss a lot of relevant documents. There is also the problem of information overload from unacceptable levels of irrelevant documents to review. Citators and digests are value-added methods of cutting through those eleven million cases.

This paper investigates the relative utility of human-generated and algorithmically-generated digests and citator results as methods of finding potentially relevant application cases

⁸⁴ *Id.* at 248. *See also, A Reconstruction of Thamus, supra*, note 55 at 135.

⁸⁵ *Id.*, Mason at 248.

⁸⁶ Paul D. Callister, *Working the Problem*, 91 ILL. BAR J. 43, 44 (2003). As far back as 1994, Westlaw’s own study of the relationship between precision and recall in the Federal Supplement database showed that as precision went up, recall went down at almost the identical rate. *Id.*

for the researcher. Questions explored include: Does it make a difference if a researcher is doing research with a human-generated topic system to generate “relevant” cases versus using an algorithmic-generated topic system to generate “relevant” cases? Do the differences in each system result in generating relevant cases not located by the other method of searching? When computer algorithms are compared for citators, are there differences in the results that are significant? Any differences in results might also illustrate some of the benefits and detriments of each kind of searching; to do exhaustive research, researchers may need to take advantage of both human indexing and computer-generated searching.

Protocols for This Study

The first step was to locate those landmark cases that have a strong effect on how the law is interpreted and that generate many citations. These cases are nodes in a network of citations.⁸⁷ In order to test the two systems and see what the results were in terms of relevance, landmark cases were first tested using the Key Numbers, or the Lexis Topics or More Like This Headnote functions. For each case, similar pairs of headnotes were used to find more cases on that particular legal topic. Then the use of headnotes as limiters in KeyCite and Shepard’s was tested to find more cases that cited the seed case on that particular headnote. Although the headnotes in Westlaw and Lexis are generated differently, in each seed case that was reviewed, there were one or more pairs of headnotes that were similar enough to make a comparison possible. For the ninety cases reviewed for this study, the author and a research assistant used lists of most-cited cases provided by Westlaw, Lexis and Hein Online to identify cases that had matching headnotes. Over 450 cases were reviewed to find 90 suitable cases, in addition to the ten cases

⁸⁷ Staffan Malmgren, TOWARDS A THEORY OF JURISPRUDENTIAL RELEVANCE RANKING: USING LINK ANALYSIS ON EU CASE LAW, Master of Laws Thesis, Stockholm University, Sept. 4, 2011, at 38.

from the previous study. To be selected for inclusion in this study, a case had to have matching headnotes that generated a sufficiently complex statement of relevance. Some cases had headnotes that matched, but the principle of law was so general that it generated hundreds of string cites. If a case made it past these two steps, then limiters were used to reduce the number of cases for review to a reasonable amount; these limiters included headnotes, document type, jurisdictional, and, where appropriate, Focus or Locate in Result. If the case could not be sufficiently limited in its search results, that case was not included in this study.

For each pair of headnotes, a statement of relevance was created that would guide the review of each case. Criteria for relevance were chosen prior to running any searches. Each statement of relevance was taken directly from the headnote, but was slightly more focused to correlate to a more real-world research need. When reviewing cases, the research assistants were asked to read the summary of each case and to use Focus (LexisNexis) or Locate in Result (Westlaw) to review the relevant portions of a case before making a determination about the relevance of the case.

Students were sent a list of instructions for each case.⁸⁸ In order to find more cases on that particular legal topic, the students reviewed cases found using the Key Numbers and the Lexis Topics and More Like This Headnote functions for similar pairs of headnotes. The students then tested the use of headnotes as limiters in KeyCite and Shepard's to find more cases that cited the seed case for the issue in that particular headnote. For each case, the starting point for research in both digest and citators was the headnote. In the online environment, researchers can easily use both functions directly from the headnote.

For both citator and digest searches, the students returned a spreadsheet of cases retrieved

⁸⁸ See Appendix B, *infra*, for an example of the instructions that students received.

with each case marked “relevant” or “not relevant.” The students also entered data in a separate spreadsheet of results, noting the number of unique cases, the number of cases in both databases, the number of unique relevant cases, and so on. For digests, Key Number results are returned as a finite number of results, while More Like This Headnote and Lexis Topic results are returned as a default set of results based on the preferences the researcher sets for the results of a natural language search.⁸⁹ The author and then an assistant hand-checked each set of results for accuracy. The students reviewed 4,053 cases for relevance.⁹⁰

To make sure that the research assistants had actually found relevant cases, so that the judgments of relevance were better than random assignments of relevance, five more research assistants reviewed an identical set of random cases generated by each search function, in light of the appropriate statement of relevance. Each new research assistant read the original citing or seed case, reviewed the standard of relevance and then read and reviewed each randomly generated citing case according to a five point scale set of relevance criteria ranging from “This citation would absolutely be assigned to my review pile as being potentially helpful to my argument (no doubt)” to “This citation would absolutely not be assigned to my review pile as being potentially helpful to my argument (no doubt)”⁹¹ The research assistants had no way of knowing if an individual case they were reviewing was generated by a digest or citator function, or whether the case was found by Westlaw or Lexis. The statistical review found “that sufficient statistical evidence exists to infer that the five judges were concordant (in agreement) in their

⁸⁹ For digests, if the Key Number results were less than the, then the first 10 results from the natural language generated results for More Like This Headnote and Topics were reviewed. If the Key Number results were more than 10, then the same number of results from More Like This Headnote and Topic were reviewed. The results generated for KeyCite and Shepard’s are finite numbers of results, and the actual number of cases returned for each search were reviewed.

⁹⁰ The relevance checking for this article was performed between June 1, 2010 and December 9, 2010. The statistical review was performed between January 2102 and April 2012.

⁹¹ Luftig, *supra* note 64, Appendix A, at 6-8.

evaluations of the degree of relevancy exhibited by the citations generated by the five search functions.”⁹² Having established that the relevance determinations made by the original research assistants can be relied on, the next section examines in some detail one particular example.

Parsing One Case in Some Detail

Digests

Using *Regents v. Bakke*⁹³ as the example, the following two headnotes, although the wording is not identical, discuss the same legal principle and can be compared:

Westlaw’s Headnote 10 from *Regents v. Bakke*:

Racial and ethnic distinctions of any sort are inherently suspect and call for the most exacting judicial examination; such suspect classifications are subject to strict scrutiny and can be justified only if they further a compelling government purpose and, even then, only if no less restrictive alternative is available.

Lexis’s Headnote 9 from *Regents v. Bakke*:

When political judgments touch upon an individual's race or ethnic background, he is entitled to a judicial determination that the burden he is asked to bear on that basis is precisely tailored to serve a compelling governmental interest. The Constitution guarantees that right to every person regardless of his background.

Review of West Key Number Cases

This is what Westlaw’s Headnote 10 looks like embedded in its classification system:⁹⁴

Westlaw Headnote 10

⁹² *Id.*, at 7.

⁹³ 438 U.S. 265 (1965).

⁹⁴ Screen reprinted from Westlaw with permission; Copyright 2012.

[10] [KeyCite Citing References for this Headnote](#)

- ↳ 78 Civil Rights
 - ↳ 78I Rights Protected and Discrimination Prohibited in General
 - ↳ 78k1007 Bases of Discrimination and Classes Protected
 - ↳ 78k1009 k. Race, Color, Ethnicity, or National Origin. [Most Cited Cases](#)
(Formerly 78k104.2, 78k104.1, 78k104, 78k3)
- ↳ 78 Civil Rights [KeyCite Citing References for this Headnote](#)
 - ↳ 78I Rights Protected and Discrimination Prohibited in General
 - ↳ 78k1030 Acts or Conduct Causing Deprivation
 - ↳ 78k1033 Discrimination In General
 - ↳ 78k1033(3) k. Affirmative Action and Reverse Discrimination. [Most Cited Cases](#)
(Formerly 78k104.2, 78k104.1, 78k104, 78k3)

Racial and ethnic distinctions of any sort are inherently suspect and call for the most exacting judicial examination; such suspect classifications are subject to strict scrutiny and can be justified only if they further a compelling government purpose and, even then, only if no less restrictive alternative is available.

The research assistants were asked to use Key Number 78k1033(3). The jurisdictional limits that were set for the search were state and federal cases for Connecticut.

There were five annotations associated with use **West Key Number 78k1033(3)** in state and federal cases for Connecticut.⁹⁵ The search screen for the Custom Digest looks like this.⁹⁶

⁹⁵ Although there were no key word limiters for this particular search, a few of the case results required key word limiters to bring the number of results down to a manageable number for the research assistants to review. Because results from annotations (West's Digest Key Numbers) and full text results (Lexis Topics) were being compared, keyword searches were chosen that would not be too limiting when only searching Key Number annotations and would also not be too broad when searching the full-text of cases on Lexis. When it was unclear from the annotation whether or not the case in the Westlaw Digest was relevant, the full text of the case would be reviewed. A full set of search instructions was given to each student; a sample set of instructions can be reviewed at Appendix B, *infra*. Instructions for all cases in the study are on file with the author.

⁹⁶ Screen reprinted from Westlaw with permission; Copyright 2012.

Westlaw's Custom Digest

Westlaw. FIND & PRINT KEYCITE DIRECTORY
COURT DOCS FORMFINDER PEOPLE MAP

Law School Colorado

Custom Digest [West Key Number Digest](#) > Search

Search

Your digest selection(s): CIVIL RIGHTS 78k1033(3) Affirmative action and reverse discrimin...

Your digest options:

Order:

Most Recent Cases

Most Cited Cases

Include ALR, law reviews, and other references

Your default state jurisdiction is: Colorado

State: Colorado

Federal: U.S. Court of Appeals - 2nd Circuit

State & Federal: Connecticut

Topical: Bankruptcy - Federal

Include cases from the highest court only

Add search terms and/or connectors (optional):

There were five results, and three unique citations. Four were relevant (starred below) and one was not:⁹⁷

1. Brewer v. West Irondequoit Cent. School Dist., 12 .3d 738*
2. Regents of the University of California v. Bakke 438 U.S. 265*
3. Regents of the University of California v. Bakke 438 U.S. 265*
4. Regents of the University of California v. Bakke 438 U.S. 265*

5. Patterson v. Newspaper and Mail Deliverers' Union of New York and Vicinity
514 F.2d 767

⁹⁷ In the Westlaw Digest results, there are sometimes multiple entries for one case. Where there were multiple entries, each instance was separately counted as a case entry and reviewed separately for relevance.

Review of Lexis Topics Cases

Here is what Lexis's Headnote 9 looks like embedded in its classification system:⁹⁸

Lexis Headnote 9



There are two Lexis Topics lines for this headnote that could be used to retrieve more cases on the topic, and the one chosen for review was the second line because it touched on both equal protection and race. The jurisdictional limits that were set for the search were the federal and state courts combined for Connecticut. To start the Lexis Topics Search, the researcher clicks on the “all” button at the end of the Lexis Topics classification line, which links to this screen:⁹⁹

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Lexis Topics Classification Line Search

Lexis®

Search ▾ Get a Document ▾ Shepard's® ▾ More ▾

Retrieve all headnotes and additional cases on Race [Help](#)

All Topics > Constitutional Law > Equal Protection > Race [i](#)

Jurisdiction: CT Federal & State Cases, Combined ▾

Optional: Restrict by Date

No Date Restrictions ▾ From To

The jurisdiction has been chosen, and if one clicks the “Go” button, the researcher is looking at a result set of 599 cases. The research assistant reviewed the first ten; three of the ten were relevant (starred below):¹⁰⁰

1. Ricci v. DeStefano, 129 S. Ct. 2658
2. Bartlett v. Strickland, 129 S. Ct. 1231
3. Engquist v. Or. Dep't of Agric., 553 U.S. 591
4. Snyder v. Louisiana, 552 U.S. 472
5. Parents Involved in Cmty. Sch. v. Seattle Sch. Dist. No. 1, 551 U.S. 701*
6. Miller-El v. Dretke, 545 U.S. 231
7. Johnson v. California, 543 U.S. 499
8. Gratz v. Bollinger, 539 U.S. 244*
9. Grutter v. Bollinger, 539 U.S. 306*
10. Fitzgerald v. Racing Ass'n, 539 U.S. 103

¹⁰⁰ See the protocols for reviewing the natural language results. Footnote 89, *supra*. For each case a research assistant reviewed, there were detailed instructions on headnotes, jurisdictional limits, numbers of cases to review, and any keywords. The research instructions for *Bakke* are in Appendix B, *infra*.

There are several notable things about the cases from the Key Number result set and this result set. First, there is no overlap. Second, the Lexis Topics Search returned relevant results not found in the Key Number System. One working assumption for the Lexis Topics results was that the results would be returned in order of relevance, but the relevant cases in the Key Number results were not found in the top ten results. The *Brewer* case was not in the Lexis Topics result set, and the *Bakke* case was listed as 71 out of 599.¹⁰¹

Looking at the comparisons of one hundred classification entries for similar headnotes, rather than just one, it becomes obvious that Key Number classification is more specific. In our particular example it is more specific to affirmative action plans and reverse discrimination, so that the classification system itself seems geared to more targeted results. In fact, if the search results in the Lexis Topics for the example case are limited to “affirmative action plan” and “reverse discrimination,” there are three results, and two are relevant (starred below):

1. *United States v. Paradise*, 480 U.S. 149 (1987)*
2. *Wygant v. Jackson Bd. of Education*, 476 U.S. 267*
3. *Ricci v. DeStefano*, 557 U.S. 557 (2009)

Review of More Like This Headnote Cases and Comparison to Lexis Topics Classification Lines

The trouble with these results is that they rely entirely on the existence of the appropriate keywords being found in a case, and not on a determination that a portion of a case is “about” affirmative action and reverse discrimination, regardless of whether those precise terms exist or not. One potential method to compensate for the lack of topical specificity in Lexis Topics is to try the More Like This Headnote function, which is

¹⁰¹ *Brewer v. West Irondequoit Cent. School Dist.*, 12 F.3d 738; *Regents of the University of California v. Bakke* 438 U.S. 265.

designed to bring up cases that have similar language to the specific language in the Lexis headnote. LexisNexis Research Help states: “Click the ‘More like this Headnote’ link at the end of a LexisNexis headnote to see all the cases with LexisNexis Headnotes related to that specific headnote.” This indicates that all cases relevant to the headnote topic should show up, whether or not the seed case, which here is *Bakke*, is cited.¹⁰² The More Like This Headnote function is found at the end of the headnote narrative.¹⁰³ Using this option takes the searcher to the screen below, and when limited to State and Federal Court - Connecticut, there are 99 results.¹⁰⁴


¹⁰² LexisNexis Research Help, http://web.lexis.com/help/research/gh_browsing.asp#MoreLikeThis, 2012. In addition, More Like This Headnote is a completely separate function from “Shepardize: Restrict by Headnote,” which is the second option to choose after More Like This Headnote. See Lexis headnote 9, *supra*, page 39. Shepardizing would bring up only cases that cite your case. If More Like This Headnote was not a broader search function than Shepardizing, there would be no reason for it to exist.

¹⁰³ See Lexis Headnote 9, *supra*, page 39.

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More Like This Headnote

More Like This Headnote Help

HN9 - When political judgments touch upon an individual's race or ethnic background, he is entitled to a judicial determination that the burden he is asked to bear on that basis is precisely tailored to serve a compelling governmental interest. The... [More](#) 

Jurisdiction: [Coverage Dates](#)

Federal and State Courts:

Combined Federal Courts:

US Supreme Court

US Courts of Appeals:

US District Courts:

US Special Courts:

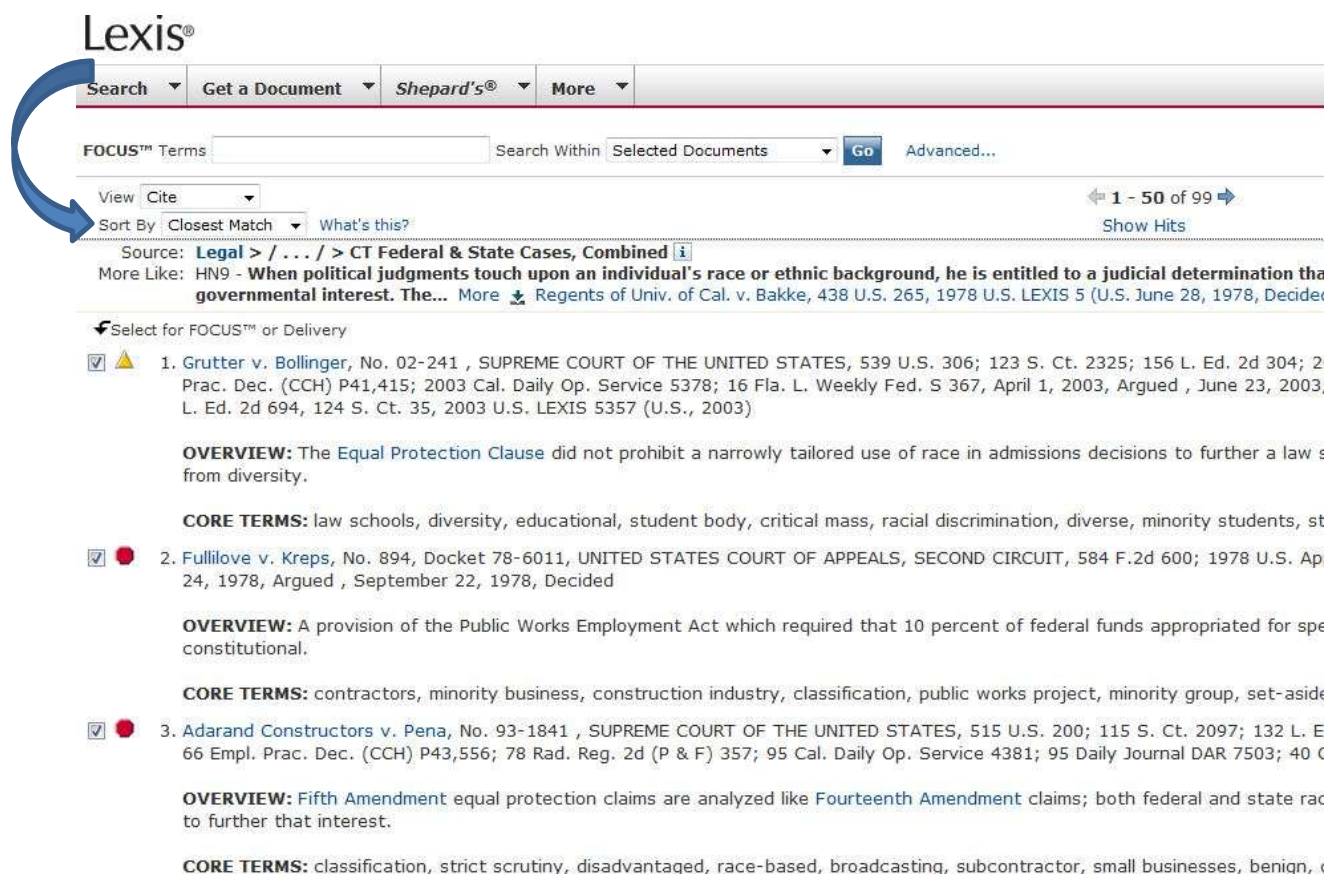
State Courts:

Optional: Restrict by Date

No Date Restrictions From To

In the future, run search automatically and skip this page

The results are sorted by “Closest Match.”¹⁰⁵



The screenshot shows the Lexis search interface. At the top, there are navigation tabs: Search, Get a Document, Shepard's®, and More. Below this is the FOCUS™ Terms search bar with a search within dropdown set to 'Selected Documents' and a 'Go' button. The results are sorted by 'Closest Match'. The source is identified as 'Legal > / ... / > CT Federal & State Cases, Combined'. The first three results are listed, each with a star icon indicating relevance. The first result is Grutter v. Bollinger, the second is Fullilove v. Kreps, and the third is Adarand Constructors v. Pena. Each result includes an overview and core terms.

Source: [Legal > / ... / > CT Federal & State Cases, Combined](#)

More Like: [HN9 - When political judgments touch upon an individual's race or ethnic background, he is entitled to a judicial determination that governmental interest. The...](#) [More](#) [Regents of Univ. of Cal. v. Bakke, 438 U.S. 265, 1978 U.S. LEXIS 5 \(U.S. June 28, 1978, Decided](#)

Select for FOCUS™ or Delivery

1. [Grutter v. Bollinger](#), No. 02-241, SUPREME COURT OF THE UNITED STATES, 539 U.S. 306; 123 S. Ct. 2325; 156 L. Ed. 2d 304; 2 Prac. Dec. (CCH) P41,415; 2003 Cal. Daily Op. Service 5378; 16 Fla. L. Weekly Fed. S 367, April 1, 2003, Argued, June 23, 2003, L. Ed. 2d 694, 124 S. Ct. 35, 2003 U.S. LEXIS 5357 (U.S., 2003)
OVERVIEW: The [Equal Protection Clause](#) did not prohibit a narrowly tailored use of race in admissions decisions to further a law s from diversity.
CORE TERMS: law schools, diversity, educational, student body, critical mass, racial discrimination, diverse, minority students, st
2. [Fullilove v. Kreps](#), No. 894, Docket 78-6011, UNITED STATES COURT OF APPEALS, SECOND CIRCUIT, 584 F.2d 600; 1978 U.S. Ap 24, 1978, Argued, September 22, 1978, Decided
OVERVIEW: A provision of the Public Works Employment Act which required that 10 percent of federal funds appropriated for spe constitutional.
CORE TERMS: contractors, minority business, construction industry, classification, public works project, minority group, set-aside
3. [Adarand Constructors v. Pena](#), No. 93-1841, SUPREME COURT OF THE UNITED STATES, 515 U.S. 200; 115 S. Ct. 2097; 132 L. E 66 Empl. Prac. Dec. (CCH) P43,556; 78 Rad. Reg. 2d (P & F) 357; 95 Cal. Daily Op. Service 4381; 95 Daily Journal DAR 7503; 40 C
OVERVIEW: Fifth Amendment equal protection claims are analyzed like Fourteenth Amendment claims; both federal and state rac to further that interest.
CORE TERMS: classification, strict scrutiny, disadvantaged, race-based, broadcasting, subcontractor, small businesses, benign, c

The first ten cases from the results are listed below; five of the ten cases are relevant (starred below):

1. [Grutter v. Bollinger](#), 539 U.S. 306 *
2. [Fullilove v. Kreps](#), 584 F.2d 600*
3. [Adarand Constructors v. Pena](#), 515 U.S. 200*
4. [Press-Enterprise Co. v. Superior Court of California](#), 464 U.S. 501
5. [Centerfolds, Inc. v. Town of Berlin](#), 352 F. Supp. 2d 183
6. [Jana-Rock Constr., Inc. v. New York State Dep't of Econ. Dev.](#), 438 F.3d 195*
7. [Crumpton v. Bridgeport Educ. Ass'n](#), 993 F.2d 1023*
8. [Adarand Constructors, Inc. v. Mineta](#), 534 U.S. 103
9. [Hobbs v. County of Westchester](#), 397 F.3d 133
10. [Murphy v. Zoning Comm'n](#), 289 F. Supp. 2d 87

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One thing that is significant about these results is that the first ten cases are almost entirely different than the first ten cases that were in the results from searching the Lexis Topics “*Constitutional Law / Equal Protection / Race.*” To test whether the differing results might come from the choice of classification line, the search was run again using the *first* classification line from Lexis Topics (*Constitutional Law / Equal Protection / Level of Review*). The first ten cases (of the 1159 cases returned) were (relevant cases are starred below):

1. *Armour v. City of Indianapolis*, 132 S. Ct. 2073
2. *Astrue v. Capato*, 132 S. Ct. 2021
3. *Felkner v. Jackson*, 131 S. Ct. 1305
4. *Levin v. Commerce Energy, Inc.*, 30 S. Ct. 2323
5. *Engquist v. Or. Dep't of Agric.*, 553 U.S. 591
6. *Parents Involved in Cmty. Sch. v. Seattle Sch. Dist. No. 551 U.S. 701**
7. *Johnson v. California*, 543 U.S. 499
8. *Tennessee v. Lane*, 541 U.S. 509
9. *Vieth v. Jubelirer*, 541 U.S. 267
10. *Grutter v. Bollinger*, 539 U.S. 306*

There is an overlap of only two cases with the *second* classification line results, and both of the overlap cases are the only relevant cases found. Again, there is no overlap in cases with the Key Number results. Of the relevant cases for Key Number results, *Regents v. Bakke* was listed as 142 out of 1159 and *Brewer v. West Irondequoit Cent. School District* was not found at all among the first 300 results. Since no reasonable researcher would review 142 or 300 results, these cases were effectively not in the result sets.

Again, more targeted results from this *first* classification line could be found by using Focus to search within results. When Focus is used with “affirmative action” and “reverse discrimination” as keyword limiters, three cases from the 1159 case set are returned, and all three are relevant:

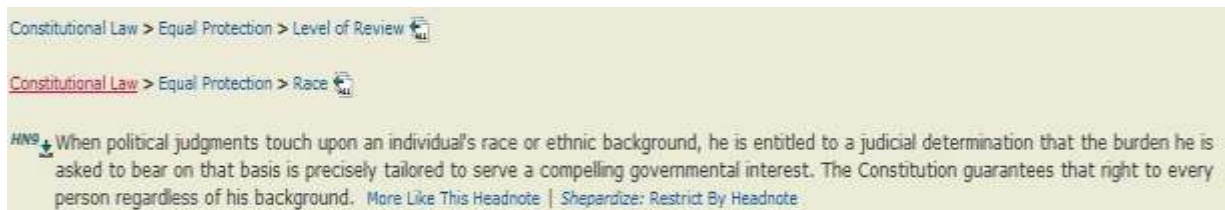
1. *United States v. Paradise*, 480 U.S. 149*
2. *Wygant v. Jackson Bd. of Education*, 476 U.S. 267*
3. *Harrison & Burrowes Bridge Constructors, Inc. v. Cuomo*, 981 F.2d 50*

Two of these cases were also located using the Focus option in the cases returned from the *second* classification line in Lexis Topics, but none of were in the first ten results from the More Like This Headnote or the first ten results from either the *first* or the *second* classification lines from Lexis Topics headnote 9 classification lines.¹⁰⁶

Review of Internal Classification Links in Lexis Topics Classification Lines

Another method of retrieving results from the Lexis Topics classification lines is to click on the lowest topic word or phrase in the line, which is Race in Headnote 9:

Headnote 9 Again



If the researcher clicks on “Race,” the screen that comes up is the Lexis Topics Classification scheme:¹⁰⁷

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All Topics

Look for a Legal Topic

Option 1: Find a Legal Topic

Find in: Constitutional Law
 All Topics

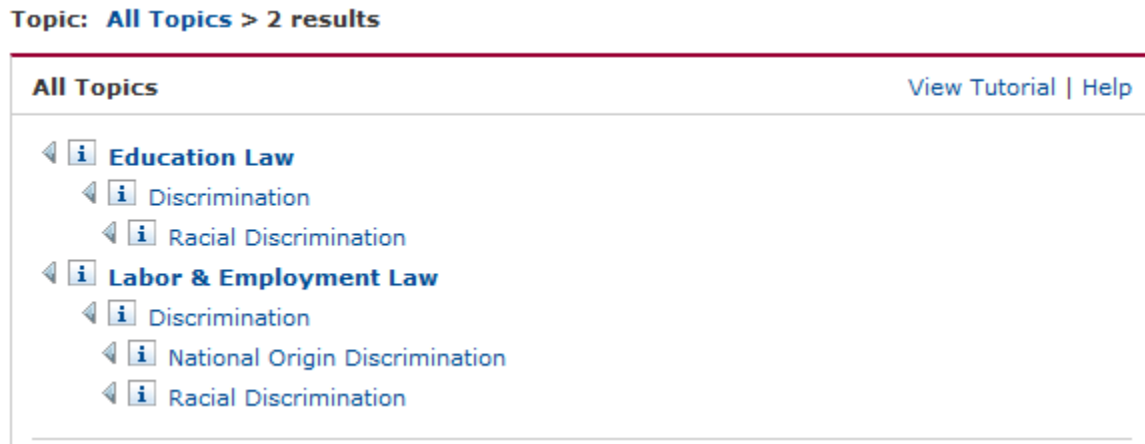
Option 2: Explore Legal Topics

- Constitutional Law**
 - General Overview
 - Congressional Duties & Powers (Related Topics...)
 - The Presidency
 - The Judiciary (Related Topics...)
 - Relations Among Governments
 - Separation of Powers (Related Topics...)
 - Amendment Process
 - Supremacy Clause (Related Topics...)
 - Bill of Rights
 - State Autonomy (Related Topics...)
 - Elections, Terms & Voting (Related Topics...)
 - Involuntary Servitude
 - Substantive Due Process
 - Equal Protection (Related Topics...)
 - General Overview
 - Age (Related Topics...)
 - Disability (Related Topics...)
 - Full & Equal Benefit
 - Gender & Sex (Related Topics...)
 - Level of Review (Related Topics...)
 - Parentage
 - Poverty (Related Topics...)
 - Race (Related Topics...)

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The researcher is given two options. The first is to “Find A Legal Topic.” If the researcher thinks to search for affirmative action here, the researcher is taken to this screen:

Two Results



The second option is to “Explore Legal Topics” by clicking on “Race” or (Related Topics). Since the researcher has already clicked this bottom classification in the All button search, opening Related Topics seems to offer a new option, and takes the researcher to the same screen shown above.¹⁰⁹ This is promising, as *Regents v. Bakke* is an education case. However the researcher got to this screen, clicking on the *Education Law / Racial Discrimination* link allows the Lexis Topics to open more fully to:¹¹⁰

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Admissions and Recruitment

Option 2: Explore Legal Topics

- Education Law**
 - General Overview
 - Administration & Operation**
 - Athletics (Related Topics...)
 - Attendance
 - Civil Liability
 - Departments of Education
 - Discrimination (Related Topics...)
 - General Overview
 - Age Discrimination (Related Topics...)
 - Disability Discrimination (Related Topics...)
 - Employment (Related Topics...)
 - Equal Educational Opportunities (Related Topics...)
 - Gender & Sex Discrimination (Related Topics...)
 - Individuals With Disabilities Education Act
 - Racial Discrimination (Related Topics...)
 - General Overview
 - Activities & Services (Related Topics...)
 - Admission & Recruitment (Related Topics...)

Admissions and Recruitment is a Related Topic in the Lexis Topics classification system, and is actually quite complex to access. This screen is, in fact, the screen that the researcher is taken to if searching the entire Lexis classification scheme for affirmative action; this search can be performed by clicking on “Search by Topic or Headnote” under the Search Tab at Lexis’s home page, for affirmative action, which is how the very first screen for Lexis’s classification of the law was located.¹¹¹ Since *Regents v. Bakke* is an education case about affirmative action in admissions, it would seem Headnote 9 might more properly have been linked to this detailed classification, and not in the more general classification actually assigned to Headnote 9. The

¹¹¹ *Supra*, at page 19.

specific *Admissions and Recruitment* entry is, in terms of specificity to the case at hand, much more like the Key Number for the Westlaw headnote than the one actually assigned. Clicking on *Admissions and Recruitment* takes the researcher to two more choices, which allow searching across multiple sources either by classification line or similar headnote.¹¹²

This can be difficult to follow, but to summarize: Westlaw offers one method of finding digest results, the Key Number system; Lexis offers multiple pathways, but the two that specifically attempt to match headnotes to a digest function are Lexis Topics (the classification lines) and More Like this Headnote. Because Lexis Topics frequently have more than one Lexis Topics entry, each entry line is another potential set of results. Each of these result sets is quite dissimilar.

Using headnotes with the same legal principle, such as Westlaw Headnote 10 and Lexis Headnote 9, it is surprising that the relevant West Digest cases - *if* they appeared in the Lexis Topics or More Like This Headnote results - were not found in at the top of the result sets, but were only found much lower in the result sets. This indicates that the language of the Lexis headnote is *not* the main determinant of relevance in the Lexis result set. It is not clear why results that do not include the language of the relevant headnote appear higher in the result sets than cases that do include relevant language.

Results of Testing For Relevance Using Digests

For the example case, the three paths to find digest topics had different percentages of relevant case returned by each search. The Key Number search for *Bakke* returned four out of five relevant cases, although because of case overlap, only two unique cases were found. For

¹¹² For a detailed discussion of this detour, please see *Relevance of Results, supra*, note 5 [at 233-237]. The article also includes a complete analysis of a different case and set of headnotes.

More Like This Headnote, of the first ten cases, three out of ten were relevant. For Lexis Topics, for the first ten cases, two out of ten were relevant. But *Bakke* is only one case, and the results for each of the other 99 cases were not similar.¹¹³ When the relevance rankings found for each of 100 cases comprising the full study are compared, then the results are 61.7% relevant results for Key Number, 48% for More Like This Headnote, and 36.7% for Lexis Topics. The higher the percentage of relevant results found, the lower the percentage of irrelevant results that have to be reviewed.

There are a few summary conclusions that can be drawn from the review of the 100 cases: Key Numbers searches return more relevant results than either Lexis More Like This Headnote or Topics. There does not seem to be a strong correlation between the Lexis headnote and the Lexis Topics; the Topics classification system seems not to be focused enough to return relevant results. Finally, each system returns a significant number of unique relevant cases not found in the other system.¹¹⁴

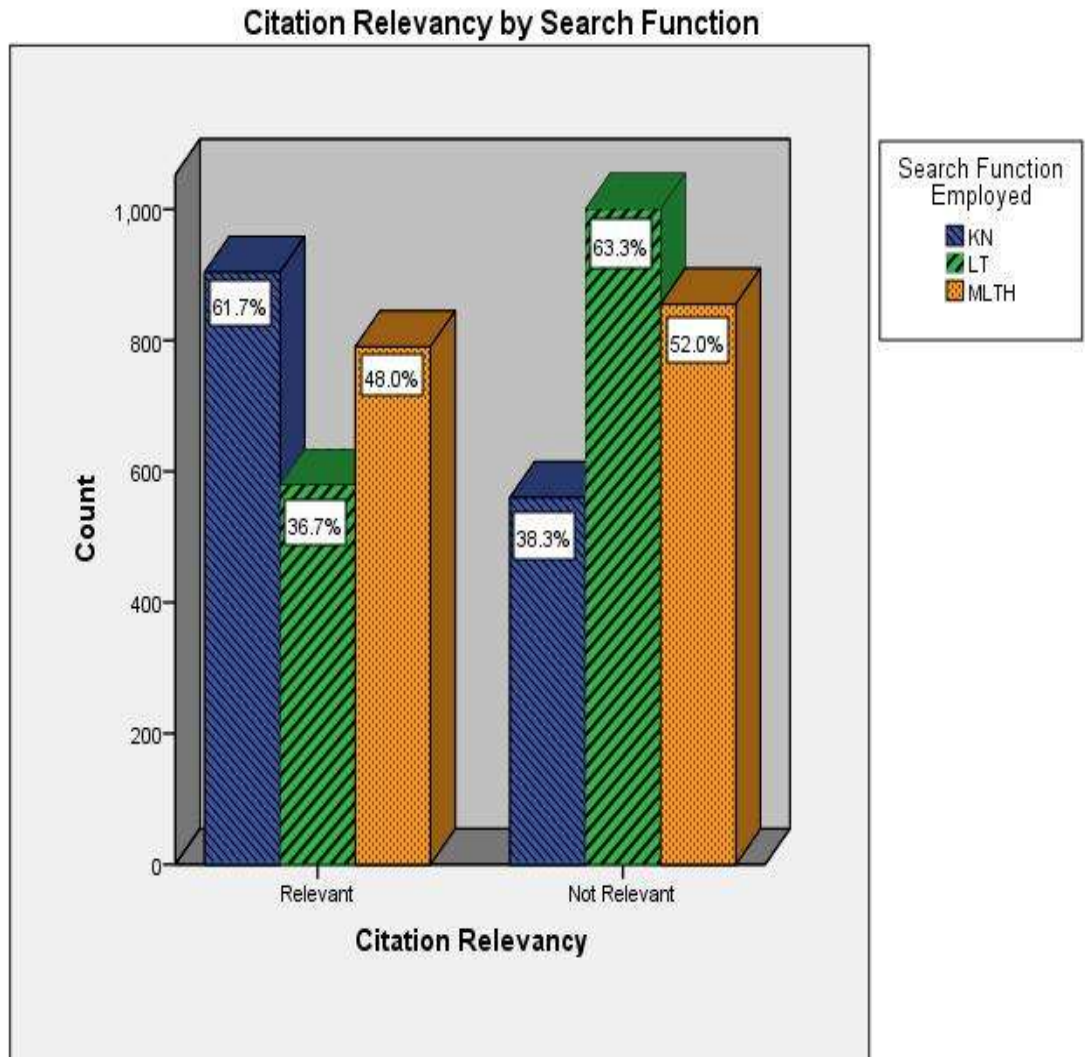
Below are the results in bar graph form, showing the average percentage of relevant cases found using West Key Numbers, Lexis More Like this Headnote, and Lexis Topics:¹¹⁵

¹¹³ The case was picked from the list of 100 cases on the basis of the author's familiarity with the topic and the case.

¹¹⁴ The spreadsheets for both digest results and citator results are on file with the author.

¹¹⁵ This bar chart was created by Jeffrey Luftig; see Appendix A, *supra*, note 64.

Citation Relevancy by Search Function



Comparing More Like This Headnote results to Key Number results, 33% of the cases found in More Like This Headnote were unique and relevant.¹¹⁶ Comparing Lexis Topics results to Key Number results, 26% of the cases found in Lexis Topics were unique and relevant.¹¹⁷

¹¹⁶ There were 549 unique and relevant cases out of a total of 1645 cases. The full data are on file with the author.

¹¹⁷ There were 413 unique and relevant cases out of a total of 1579 cases. The full data are on file with the author.

One interesting feature of the statistical review that was performed on the findings of relevance made by the original research assistants was that, although the reviewers did not know whether the cases they were looking at were returned by More Like This Headnote, Key Numbers, or Lexis Topics, they found that the relevant results returned by each of the digest functions were equally useful in terms of the relevancy of the citations identified; the mean ranking given to all of the cases was five:¹¹⁸ “This citation would absolutely be assigned to my review pile as being potentially helpful to my argument (no doubt).”

Using Digest Systems for Research

Although the percentages have changed slightly since the last study,¹¹⁹ with reduced percentages for the relevancy of results from each digest system, the relative advantages – or disadvantages – of each system remain: Key Number results are the most relevant, with More Like This Headnote second, and Lexis Topics third. It is true that each digest function will find some relevant and unique cases on one’s research topic, but none will find all relevant cases on the research topic.

The study illustrates the benefit of curation in that it is the human-curated system that has the highest percentage of relevant cases; i.e., the precision is better for Key Numbers. But the Lexis algorithms do return unique and relevant cases not found in the human-curated system. So far, it appears that the algorithms turn up a fairly unacceptable level of irrelevant cases to review, as few researchers want fifty or sixty percent of the results they review to be irrelevant.¹²⁰ In

¹¹⁸ See Luftig, Appendix A, *supra* note 64, at 8.

¹¹⁹ The percentages in the prior, smaller study were: Key Numbers = 83.2 % relevant; More Like This Headnote = 62.3% relevant; Topics = 53.2% relevant. *The Relevance of Results, supra*, note 5, at 240.

¹²⁰ The difference in results between the systems may not be statistically important. Luftig, Appendix A, *supra* note 64, at 9. But time and money are critical factors in research, and the difference will be important to many researchers.

addition, the Lexis algorithms turn up cases at the top of the results that do not have critical language from the headnote in them. Results in More Like This Headnote and Lexis Topics can be improved by using key words from the headnote as Focus search terms, but why a double search needs to be performed to get more relevant results is not clear. Another anomaly in the Lexis results is that the two search functions centered on each headnote in the system return such differing results. The overlap in cases found for the same headnote from searches on More Like This Headnote and Lexis Topics is only two percent. This indicates a very loose connection between the classification system and the headnote.

The researcher will, for each research project, have to decide whether multiple searches in more than one digest system is a worthwhile investment of time based on the database systems available and whether or not finding all relevant cases is actually a project requirement. There is a point at which the time invested in reviewing cases from multiple systems is not worth the effort for the number of new cases found. Fortunately, there are other tricks and resources to make up for any deficiencies in any one algorithm or system, such as: reviewing more than one headnote, as just one will probably be too narrow for all the facets of a legal problem; and performing other types of research. Using digests is one part of the “one good case” method, and can be a great way to find more cases on your topic, but digests are only one of many research resources available to the legal researcher.

Comparison of Citation Systems

The results of the comparisons of digest topics reveals large differences in result sets and differences in the average percentages of relevant, unique cases returned. But what happens when the result sets from citators are compared? Citation checking is, of course, another widely used tool to find more cases on a legal topic. The two major competitors are Shepard’s and

KeyCite. Both citation systems are routinely used to check whether or not a case is still good law, but can also be used to find more cases on a legal topic that cite the case you are checking. As I have discussed earlier,¹²¹ KeyCite and Shepard's use different methods to generate headnotes, with Westlaw editors summarizing the legal points in a case in their own language, and Lexis taking the language of its headnotes directly from the language of the case.¹²² But both systems assign those headnotes to citing cases algorithmically.¹²³ When similar headnotes are compared, what are the results for the relevance of the cases in the results sets generated by KeyCite and Shepard's?

Citation checking is forward looking. Unlike digest systems, which are designed to give a researcher cases on her legal topic regardless of the date the citing case was decided or whether or not the researcher's seed case is mentioned, citation systems look for every instance of a case that has cited the seed case. In addition to answering the question, "Is my seed case still good law?", citation systems will turn up cases with different facts that may be more relevant to the situation the researcher is investigating.

With important seed cases, which sit in the center of a network of citations,¹²⁴ the unfiltered results are useless. In Shepard's citations, there are 6,697 citing references, and 1,082 case citations for *Regents v. Bakke*. In KeyCite, *Bakke* has 8,882 citing references, and 1,031 case citations.¹²⁵ This is simply too many citations to be meaningful to a researcher. So focusing on the relevant headnote, as well as an appropriate jurisdiction, is a necessary method for

¹²¹ *Supra*, page 14-16 and accompanying headnote.

¹²² *Id.*

¹²³ *Id.*

¹²⁴ See Appendix B, *infra*, for a sample set of citator instructions.

¹²⁵ The other citing references are to law reviews, treatises, briefs and other references outside the main case citation databases. The differences in the number of citations can be attributed to the differences in the number of unpublished cases in each system.

returning a manageable set of potentially relevant results. In addition, limiting by jurisdiction is a critical starting place for most researchers.¹²⁶

To test the use of headnotes as limiters in KeyCite and Shepard's, the research assistants used the same set of 90 cases that they reviewed for the comparison of the digest functions in Westlaw and Lexis, and ran appropriately limited citator searches. For this citator comparison, the review focused on the numbers of citing references in common between the two citators, the numbers of unique cases for each citator, and the number of relevant cases in each set of unique results

Using *Regents v. Bakke* again, below is the detailed analysis of one case comparison:

Regents v. Bakke, Headnote 10 - Westlaw:

Racial and ethnic distinctions of any sort are inherently suspect and call for the most exacting judicial examination; such suspect classifications are subject to strict scrutiny and can be justified only if they further a compelling government purpose and, even then, only if no less restrictive alternative is available.

Regents v. Bakke, Headnote 9 - Lexis:

If allegedly libelous statements would otherwise be constitutionally protected from judgment, they do not forfeit that protection because they were published in the form of a paid advertisement.

How many cases were there on this headnote for 2nd Circuit and Connecticut cases on Shepard's?

6

How many cases were there on this headnote for 2nd Circuit and Connecticut cases on KeyCite?

5

¹²⁶ Generally speaking, law school is a jurisdiction-free zone. The use of multi-jurisdictional, edited cases in law students' case books masks the importance of jurisdiction, making a discussion of the importance of jurisdiction (and level of court) to a determination of the relevance of a case for articulating a legal argument a key lesson for new lawyers.

How many cases were the same?

1

Fullilove v. Kreps, 584 F.2d 600 (1978)

The cases that are only on KeyCite follow: none of the unique cases were relevant. Six of the nine cases (6/9 or 66%) of the cases were relevant. **Relevant** meant that a case *discussed the types of affirmative action program that are or are not tailored to serve a compelling state interest.*

1. Soberal-Perez v. Heckler, 717 F.2d 36
2. Patrolmen's Benevolent Ass'n. of City of New York v. City of New York, 310 F.3d 43
3. E.E.O.C. v. Local 638 . . . Local 28 of Sheet Metal Workers' Intern. Ass'n, 753 F.2d 1172
4. Artone v. Frank, 1990 WL 88872

The cases that are only on Lexis's Shepard's follow: the three italicized cases are **relevant** (3/5 = 69% relevant). **Relevant** meant that a case *discussed the types of affirmative action program that are or are not tailored to serve a compelling state interest.*

1. Kirkland v. New York State Dep't of Correctional Services, 711 F.2d 1117
2. Caulfield v. Board of Education, 632 F.2d 999
3. *Parent Asso. of Andrew Jackson High School v. Ambach*, 598 F.2d 705
4. *Honadle v. University of Vermont & State Agric. College*, 56 F. Supp. 2d 419
5. *International Brotherhood of Electrical Workers v. Hartford*, 462 F. Supp. 1271

This comparison shows that if you were looking for additional cases involving the contours of affirmative action programs, then in addition to the one case that appeared in both citators, there were nine more unique cases to be found;. Four were on KeyCite and five were in Shepard's. Of these unique cases, there were four more relevant cases, all in Shepard's in this

example. If you only used KeyCite, a researcher would miss 100% of the unique relevant cases.¹²⁷

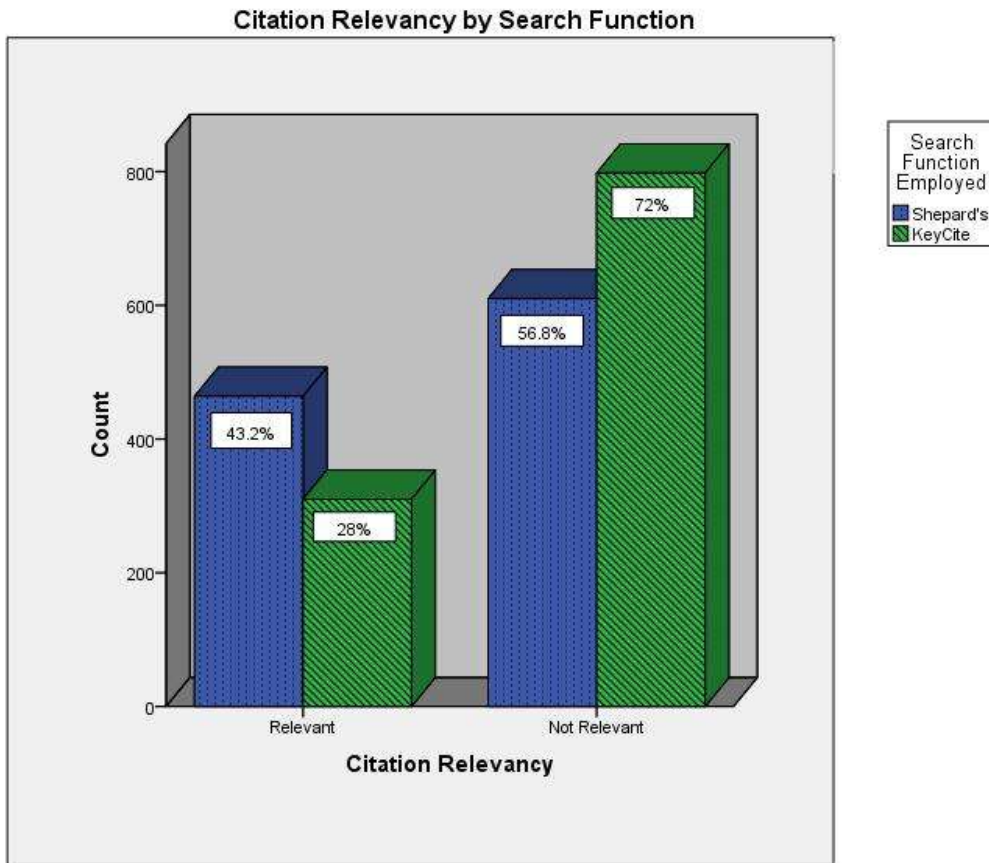
The results for this comparison are not the same as the results for the comparisons that were performed for the other 89 of the 90 cases reviewed for this study. Each case comparison differed in its results, but in each instance, there were unique cases found in each system and in each case, the relevance of the cases in each system differed. For each case the research assistants reviewed, there were instructions on headnote and jurisdiction limits, as well as the statement of relevance to guide the determination of relevance.¹²⁸ Below are the average percentages of relevant results for unique cases in each system:¹²⁹

¹²⁷ In addition to missing relevant cases, the researcher must review irrelevant cases. In this example, if you used Shepard's, 40% of the cases you looked at would be irrelevant (2/5). Using KeyCite, 100% of the cases you looked at would be irrelevant (4/4).

¹²⁸ See Appendix B, *infra*.

¹²⁹ Bar chart created by Jeffrey Luftig; see Appendix A, *supra* note 64.

Citation Relevancy by Search Function



Each citator system returned relevant results, with Shepard's having the edge by 15%. That would give the advantage in algorithmic power to Lexis. What is more astonishing is the relative lack of consistency in the results returned. The percentage of overlap between the two systems is only 33%.¹³⁰ That means each system had a very high number of unique cases. In terms of how many of those relevant cases were unique, for Shepard's, 42% of the cases were unique and relevant,¹³¹ while for KeyCite, 31% of the cases were unique and relevant.¹³² The higher number

¹³⁰ There were 1075 cases reviewed from Shepard's searches and 1130 cases reviewed from KeyCite searches. There were 549 cases that appeared in both systems. So there were a total of 1656 unique cases ($549/1656 = 33\%$). The full data are on file with the author.

¹³¹ There were 456 unique and relevant cases out of a total of 1075 cases. The full data are on file with the author.

of unique cases and higher percentage of relevant results means that Shepard's is finding twice as many unique relevant results as KeyCite, but it is not finding all of the relevant results.

When the citations found by KeyCite and Shepard's were reviewed as part of the statistical analysis of the work done by the original research assistants, the results indicated that the relevant citations identified by Shepard's were slightly more relevant than those located in KeyCite. The median relevance standard chosen for KeyCite's cases was a four:¹³³ "This citation would most likely be assigned to the review pile as being potentially helpful to my argument." This slight difference in the quality of the cases in KeyCite was not found to be statistically important.¹³⁴

Using Citation Systems for Research

After reviewing ninety additional cases for this study, the results are consistent with the findings of the earlier survey.¹³⁵ Here, either the different algorithms used to match headnotes to citing references, or the different ways in which headnotes are generated, or both, provide unique cases on both systems. It was surprising how few cases each citation system had in common; there was not that much overlap in the cases found using KeyCite with the cases found using Shepard's. As a computer programming novice I still find this very surprising—it seems a simpler matter than it must be to match a pincite from the cited case to every instance where that citation occurs. It is hard to imagine a case that cites a seed case on a specific legal topic not citing back to the original page reference. That might not, in a subjective review, mean that each case found by a citator system was relevant to a specific researcher's needs. But it would bring in more

¹³² There were 318 unique and relevant cases out of a total of 1130 cases. The full data are on file with the author

¹³³ See Luftig, Appendix A, *supra* note 64, at 9. A five would be: "This citation would absolutely be assigned to my review pile as being potentially helpful to my argument (no doubt)."

¹³⁴ *Id.*

¹³⁵ *Relevance of Results, supra*, note 5, at 247.

potentially relevant results into each result set. As the algorithms are currently configured, each citation system still has a large percentage of cases linking to relevant cases not found by the other citation system.¹³⁶

Although using both systems to find relevant cases would result in more thorough results, those with access to only one system should not despair. Redundancy from using multiple other legal resources should cure the problem. But re-searching, revising, and redundancy in searching need to be highlighted for searchers whose conception of search results is formed by viewing results in Google, where only the first results may be consulted.¹³⁷

Conclusion

Where the search process is curated – where it has more human intervention - it delivers better results. Intermediated searching is what appears to distinguish between Westlaw and Lexis in the comparison of each one’s classification system. Key Numbers, with their intermediated correlation between the headnote and the classification topic, deliver more relevant results than any of the options offered by Lexis. The results for the Lexis Topics and More Like This Headnote do not overlap by much, although logic would indicate that there should be a fairly substantial match between the headnote and the classification topic. Both Lexis Topics and More Like This Headnote return result sets that include cases that do not make any reference to the

¹³⁶ There’s a new offering in the citator world. Justis Publishing is offering a citator that acts as if a human was involved, according to their promotional material. Here is an email delivered 12/6/2010, promoting the company’s new JustCite feature (emphasis in the original): “Like no other legal search engine, its algorithms consider the relationship cases have with each other. So when you search for a phrase, case name, citation or any other query, your results are ranked as if **selected by legal experts for true relevance**, not by a machine arranging them by keyword frequency. In short, the JustCite citator directs you to winning results in a flash.” (emphasis added); also available at <http://www.justispublishing.com/current/wp-content/uploads/2011/02/slr-advertorial-january-11.pdf>.

¹³⁷ Chris Sherman, *Search Engine User Attitudes*, GShift, <http://searchenginewatch.com/article/2067093/Search-Engine-User-Attitudes>, May 24, 2004.

targeted headnote language, suggesting that the algorithms in use have not been completely effective in making that necessary, direct link between the headnote language and the classification topic.

Although the Lexis result sets are less relevant than the Westlaw results, Lexis result sets do include relevant results not captured in Westlaw's Digest System. Some of my students preferred Lexis's More Like This Headnote for the seeming freedom of using a large, full-text case result set and searching within those results using Focus, even after they realized that Key Number results sets were more relevant. Each researcher will have to determine the best use of each system for individual research projects. Using headnotes to branch out into digest and citators and knowing that the results will vary is one way for novice researchers to visualize the inter-connectedness of legal research sources and to appreciate the value-added benefit human indexing brings to modern searching:¹³⁸

Every research tool is part of a larger research universe. A source may cite to cases, statutes, regulations, other works, other sets, other authors. Think of each research tool as the center of a great cross-hatching of information.¹³⁹

¹³⁸ Use of human generated indexes – whether on line or in print – helps search results. The value added from human generated indexes is illustrated by a 2008 BNA study. In the BNA study, law students were given a series of research questions to answer in *United States Law Week*; half of the questions were to be answered using indexes and the other half using full-text searching. “In the BNA Usability Study, index users had an 86 percent success rate while text searchers had only a 23 percent success rate. The study included both single answer and more complex research tasks. Results for the various types of tasks confirmed many limits of text searching. Text searching can be successful in locating proper names or an isolated piece of information involving very specific facts. However, for most legal research tasks, using an index provides more relevant and complete results.” BNA Law School Education Series: Using Online Indexes, <http://www.levtechinc.com/pdf/Using%20BNA%20Indexes%20study.pdf>.

¹³⁹ Robert C. Berring and Elizabeth A. Edinger, *FINDING THE LAW* 12th ed. (2005) at 335-336.

The intervention of humans as curators in online environments is being recognized as a way to add value to an algorithm's results, in legal research tools as well as web-based applications in other areas. Humans still have an edge in predicting which cases are relevant. And the intersection of human curation and algorithmically-generated data sets is already well underway.¹⁴⁰ More curation will improve the quality of results in legal research tools, and most particularly can be used to address the algorithmic deficit that still seems to exist where analogic reasoning is needed.¹⁴¹ So for legal research, there is a case for curation. And understanding the way research resources are constructed will help researchers to understand the power and the limitations of the research resources they are using.

¹⁴⁰ Cashmore, *Humans vs. Automated Search*, *supra*, note XX.

¹⁴¹ Ronald E. Wheeler, *Does WestlawNext Really Change Everything? The Implications of WestlawNext on Legal Research*, 103 LAW LIBR. J. 359, 365 (2011), *see also*, Vinod Krishnan, *et al.*, *Who Predicts Better? – Results from an Online Study Comparing Humans and an Online Recommender System*, www-users.cs.umn.edu/~vinod/index_files/vinod-recsys.pdf. (Humans outperformed machines where the profiles being reviewed were more complex and quirky).

Regents of the University of California v. Bakke, 438 U.S. 265 (1978)

[\[10\] KeyCite Citing References for this Headnote](#)

[78 Civil Rights](#)

[78I Rights Protected and Discrimination Prohibited in General](#)

[78k1007 Bases of Discrimination and Classes Protected](#)

[78k1009 k. Race, Color, Ethnicity, or National Origin. \[Most Cited Cases\]\(#\)](#)
(Formerly 78k104.2, 78k104.1, 78k104, 78k3)

[78 Civil Rights \[KeyCite Citing References for this Headnote\]\(#\)](#)

[78I Rights Protected and Discrimination Prohibited in General](#)

[78k1030 Acts or Conduct Causing Deprivation](#)

[78k1033 Discrimination in General](#)

[78k1033\(3\) k. Affirmative Action and Reverse Discrimination. \[Most Cited Cases\]\(#\)](#)
(Formerly 78k104.2, 78k104.1, 78k104, 78k3)

Racial and ethnic distinctions of any sort are inherently suspect and call for the most exacting judicial examination; such suspect classifications are subject to strict scrutiny and can be justified only if they further a compelling government purpose and, even then, only if no less restrictive alternative is available

[Constitutional Law](#) > [Equal Protection](#) > [Level of Review](#)

[Constitutional Law](#) > [Equal Protection](#) > [Race](#)

HN9

When political judgments touch upon an individual's race or ethnic background, he is entitled to a judicial determination that the burden he is asked to bear on that basis is precisely tailored to serve a compelling governmental interest. The Constitution guarantees that right to every person regardless of his background. [More Like This Headnote](#) | [Shepardize: Restrict By Headnote](#)

Statement of Relevance: Discusses the types of affirmative action program that are or are not tailored to serve a compelling state interest.

KeyCite limiters: cases only; both headnote 10s; jurisdiction = 2nd circuit and district cases and Connecticut.

Shepard's limiters: headnote 9; jurisdiction = 2nd circuit and Connecticut.

Key Number limiters: [78k1033\(3\)](#); jurisdiction = state and federal Connecticut.

Lexis MLTH limiters; jurisdiction = federal and state courts combined Connecticut; review first 10.

Lexis Topic limiters: [Constitutional Law](#) > [Equal Protection](#) > [Race](#) ; click all; jurisdiction = CT federal and state cases combined. Review the first 10.